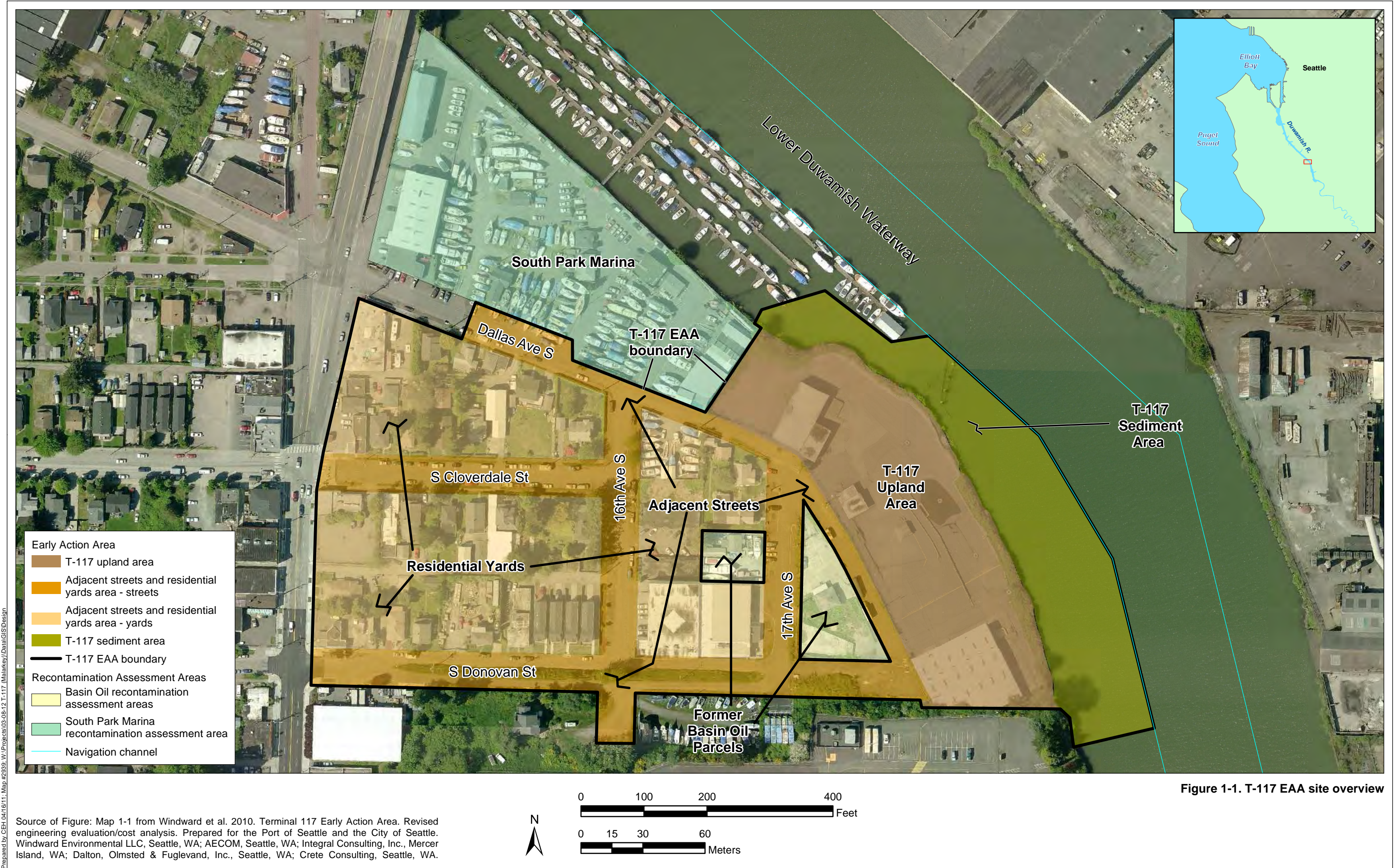
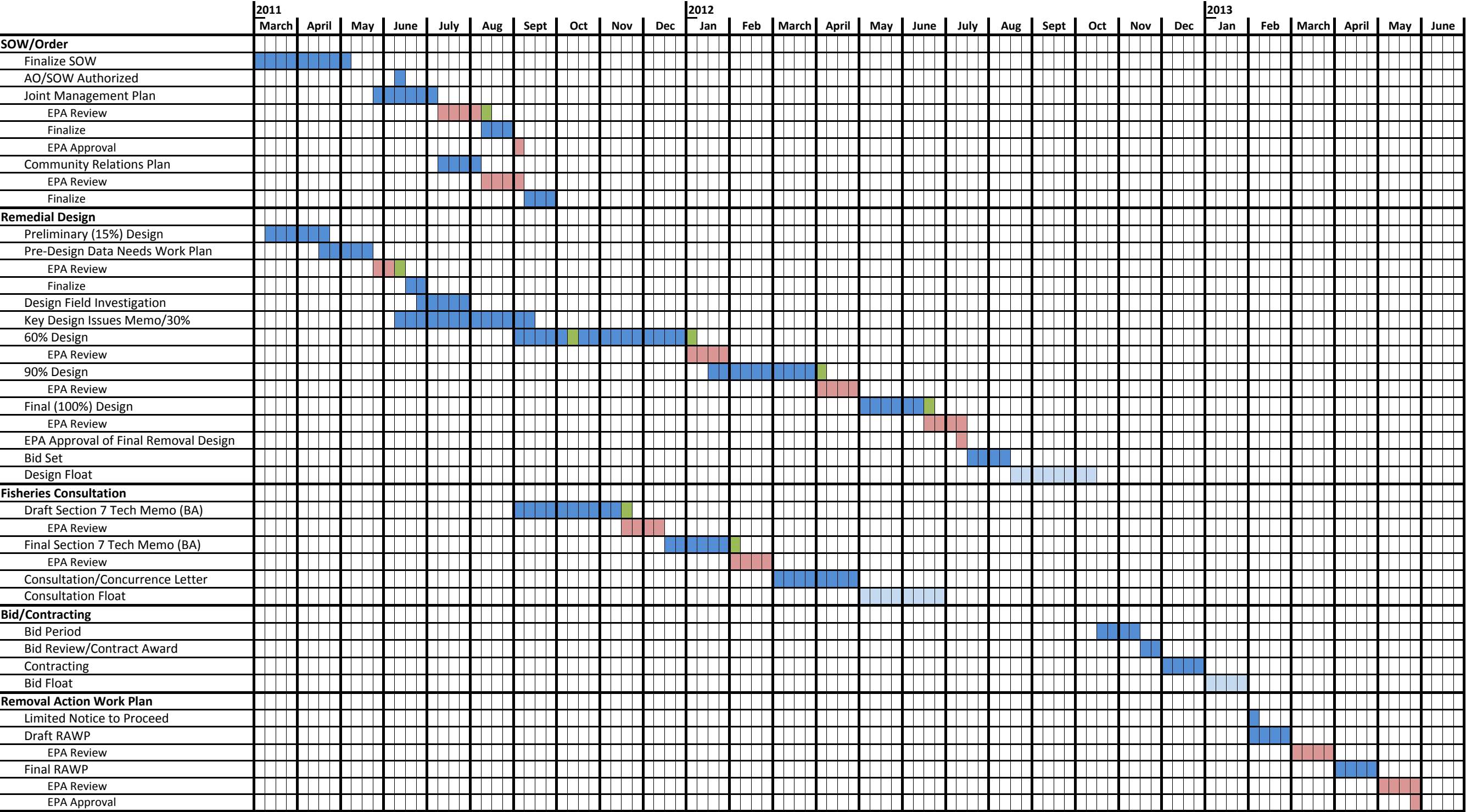


Figures



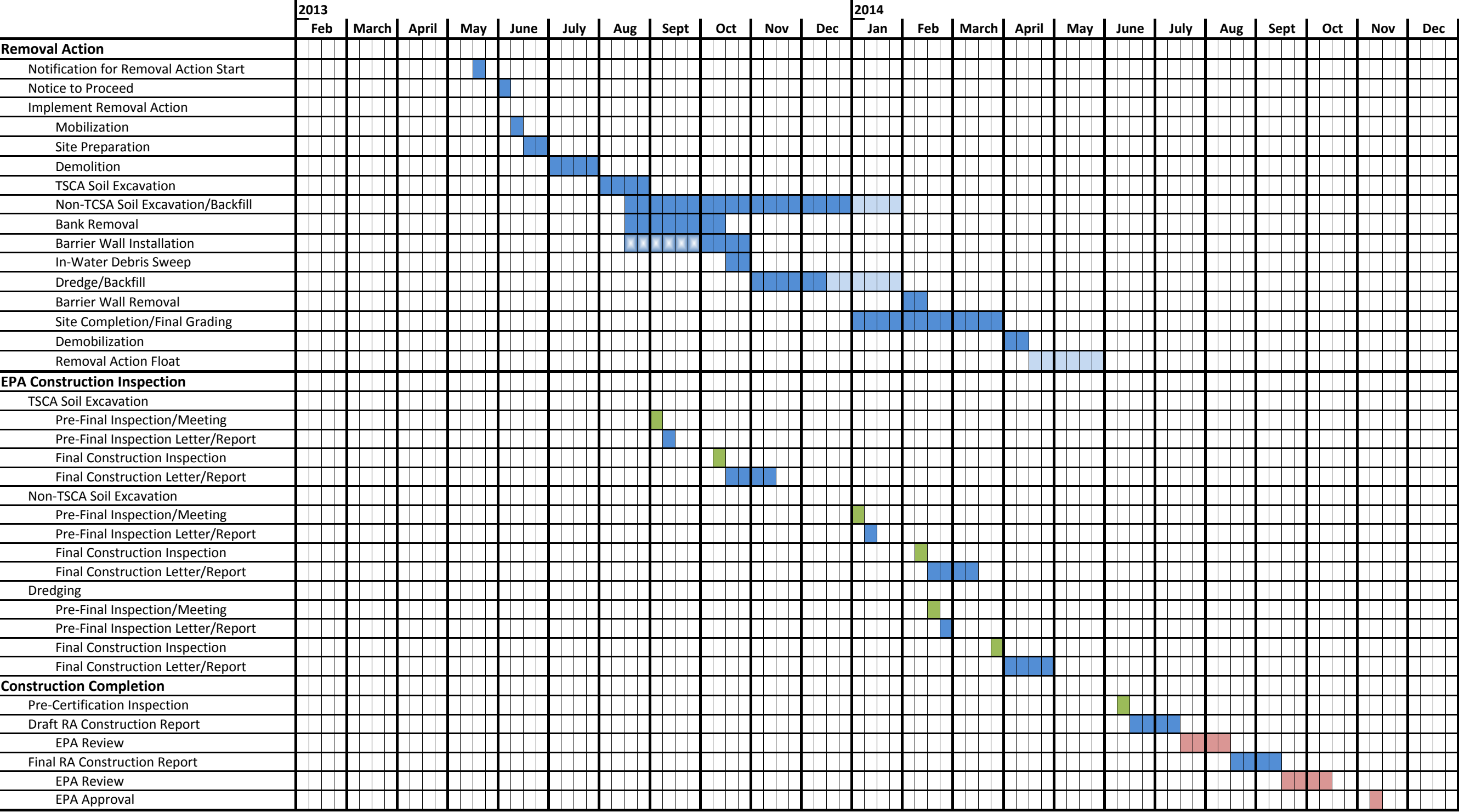
Prepared by CEH 04/16/11; Map #2839; W:\Projects\03-08-12 T-117 (Malarkey)\Data\GIS\Design

Figure 5-1a - RvD/RvA Timeline
T-117 Cleanup Design - Sediment and Upland



- Notes:
- Design/Client Team Activity
 - Float
 - EPA Review
 - Design/Client/EPA Meeting

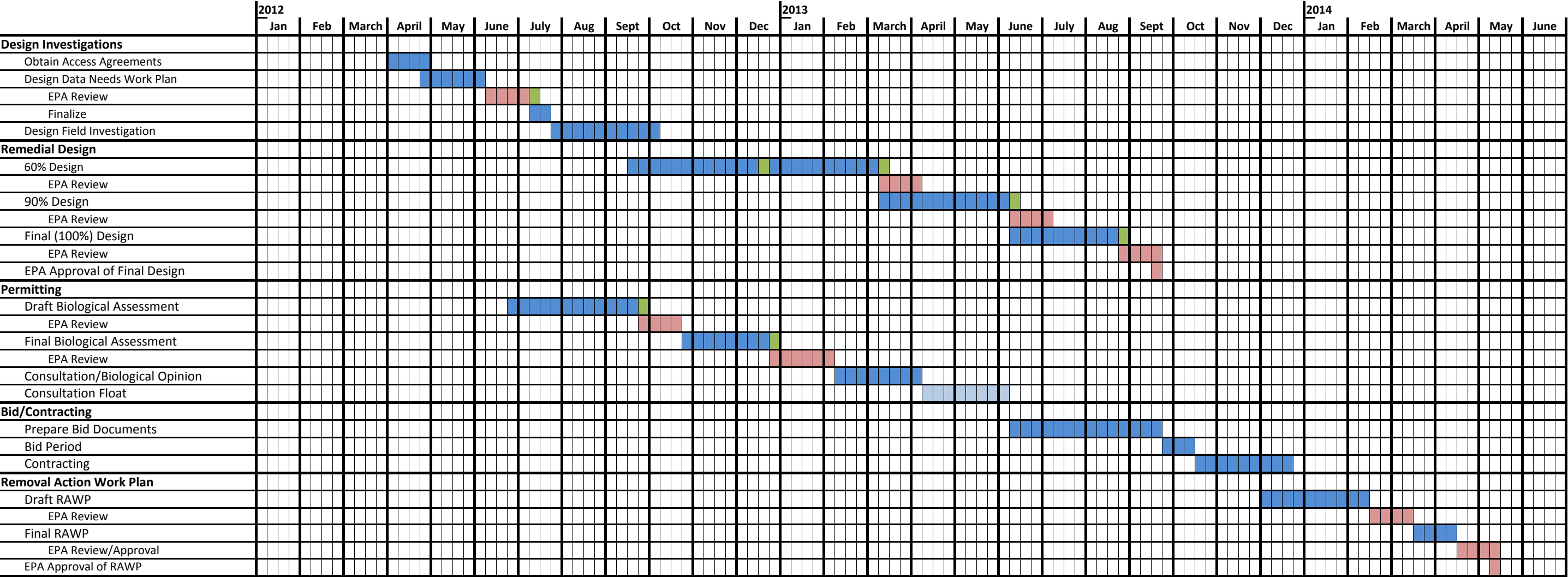
Figure 5-1b - RvD/RvA Timeline
T-117 Cleanup Design - Sediment and Upland



Notes:

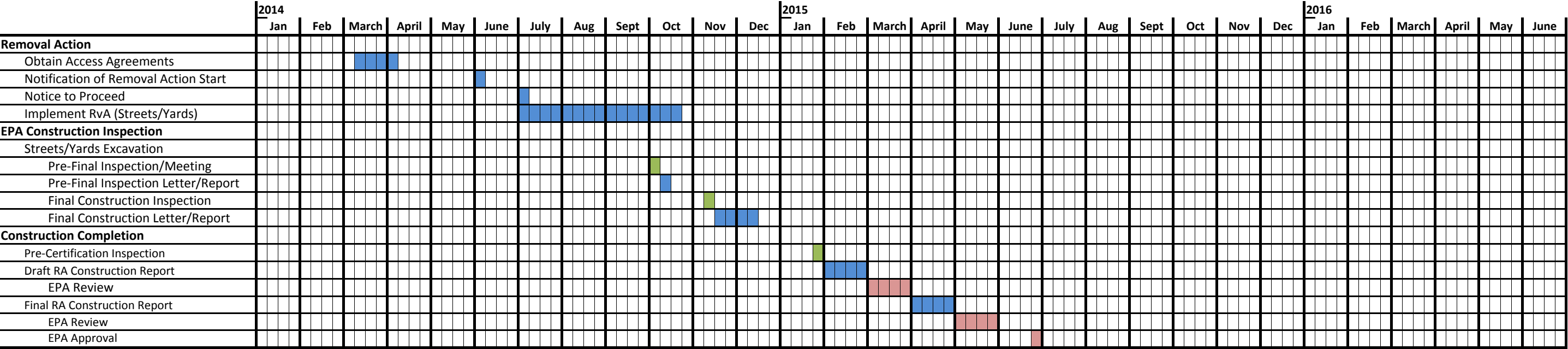
- Design/Client Team Activity
- Float
- EPA Review
- Design/Client/EPA Meeting

Figure 5-2a - Remedial Design Timeline
T-117 Cleanup Design - Streets and Yards



- Notes:
- Design/Client Team Activity
 - Float
 - EPA Review
 - Design/Client/EPA Meeting

Figure 5-2a - Remedial Design Timeline
T-117 Cleanup Design - Streets and Yards



- Notes:
- Design/Client Team Activity
 - Float
 - EPA Review
 - Design/Client/EPA Meeting

Appendix A

Qualification of Contractors

Contractor Qualifications – T-117 Cleanup Design - Sediment and Upland Area

INTRODUCTION

The Port has retained one contractor (consultant: CRETE Consulting) to perform the Lower Duwamish Superfund Site Terminal 117 Early Action Area (T-117 EAA) Scope of Work. CRETE Consulting is using five primary subcontractors (sub-consultant to CRETE: Jacobs Associates, Moffatt and Nichol, Grette Associates, AECOM, and Enviroissues) In summary, the contractor/subcontractor names are:

- CRETE Consulting
- Jacobs Associates
- Moffatt and Nichol
- Grette Associates
- AECOM
- Enviroissues

As required in Section VII, Section 10 of the Administrative Settlement Agreement and Order on Consent (ASAOC), the qualifications for each of these firms are provided below.

CRETE CONSULTING

CRETE Consulting Incorporated (CRETE) is a Seattle-based consulting firm providing environmental consulting and engineering services for complex cleanup projects. These projects require integration of multiple team members, management of numerous stakeholders, and coordination with site redevelopment. The CRETE team brings proven success with members that have worked together for over 15 years. The CRETE team has developed and applied the tools and techniques to successfully implement complex cleanup projects, many of them in conjunction with commercial/industrial development and habitat goals.

Key T-117 team members include:

Grant Hainsworth, Project Manager, is an experienced project manager for the Port, is familiar with the relevant technical and regulatory issues, has extensive remedial design and construction experience, and is familiar with South Park community groups and stakeholders. He understands all aspects of large, complex projects and has a proven record of success. Grant was project manager for the Seahawks Headquarters project on Lake Washington that included design, permitting, bid documents, and construction oversight for sediment cleanup, shoreline habitat restoration, upland cleanup, and integration of cleanup with construction of offices, fields, and public access. Grant was also project manager for the 2006 TCRA design and cleanup and associated bank stabilization under CERCLA Order at T-117, taking the project through the EPA process on an accelerated schedule, while satisfying MTCA requirements, and effectively addressing community concerns.

Mike Byers is the lead site/civil engineer for the largest environmental cleanup project in the region. Mike has successfully led design and construction oversight of the Skykomish multi-year remediation project that includes 15 subconsultants and over 35 design, consulting, and construction management professionals, including most members of this team. The Skykomish project includes cleanup of sediment and soil, including the temporary relocation of homes and businesses and reestablishment of municipal infrastructure including sewers and power.

Greg Hartman is the sediment lead and was the design engineer for sediment remediation at the Lockheed sediment operable unit at Harbor Island. Sediment dredging is a significant portion of the T-117 cleanup because of the potential for stakeholder interest due to water quality issues during previous Lower Duwamish actions. Greg is working on the Hudson River PCB dredging project and has worked with team members on the Gas Works Park and Lower Fox River projects.

CRETE personnel identified for this project worked on the 2006 TCRA for the T-117 upland, the 2010 EE/CA for the entire T-117 EEA, and have extensive working knowledge of the history and site specific conditions at the T-117 EAA.

AECOM

AECOM is a global engineering, science, architectural and environmental firm with over 45,000 employees covering all aspects of planning, design, construction, operations and maintenance. AECOM employs over 200 dedicated professionals in the Pacific Northwest. Our Bellingham, Seattle, Redmond, Spokane, Richland and Portland offices include civil, structural, electrical and mechanical engineers, geologists, hydrogeologists, chemists, ecologists, landscape architects, planners, construction managers, regulatory specialists, GIS and CAD specialists in addition to other support staff.

Specific areas of expertise related to the T-117 EAA include the following:

- Identification and evaluation of sediment management alternatives
 - River hydraulics, sediment transport, and erosion control
 - Bank and shoreline rehabilitation alternatives
 - Dredging methods evaluation and selection
 - Dredged material rehandling methods for upland landfill disposal
- Design and construction oversight of in-water projects
 - Design, plans, and specifications for dredging, disposal, capping, bank restoration, and aquatic construction
 - Cost estimates and schedules for in-water projects
 - Construction oversight

ENVIROISSUES

EnviroIssues was founded in 1990 to provide public outreach and communications support on a range of sensitive and often controversial projects. Since that time, we have grown to approximately 80 professionals and have worked on many of the region's most interesting and challenging issues – land use and open space planning, transportation, design and construction of capital facilities, economic development, environmental and social justice, environmental

impact assessment, cleanup and redevelopment of industrial sites, and many others. We have offices in Seattle, Tacoma, Richland, Portland and Boise.

EnviroIssues' previous public involvement work during the T-117 EE/CA process involved neighborhood outreach, project material development, and communication and coordination. We will continue to provide this support throughout the T-117 cleanup design. Specifically, our areas of expertise strengthen our ability to:

- Bring the T-117 community, project stakeholders and decision-makers together to move cleanup design forward
- Help the various agencies involved in T-117 project tackle challenging issues
- Communicate with the diverse residents of South Park by coordinating interpreter and translator services for in-person meetings and all printed materials
- Build a common understanding of the opportunities, constraints and technical realities of the
- T-117 cleanup project
- Provide effective and targeted outreach, including coordinating public meetings, managing the community listening log, and handling and distributing strategic communications (website, print collateral, etc.)
- Reinforce the Port's presence in the community by staffing local fairs/festivals, supporting briefings to local organizations, maintaining the physical project kiosk materials, and distributing flyers in the neighborhood

GRETTE ASSOCIATES

Grette Associates was formed in 2002 and has experience in the consulting field in fisheries ecology, habitat restoration and mitigation, impact assessment, permitting, and Endangered Species Act (ESA) compliance. Grette Staff has been involved from initial strategy development through remedial design, construction, and post-project monitoring on major CERCLA sediment remediation actions in Commencement Bay and MTCA actions elsewhere in Puget Sound. Grette Staff has also managed or supported permitting, environmental review and ESA compliance for numerous large-scale in-water development projects for Puget Sound Ports. Grette Associates has had a substantial role in permitting over twenty large-scale dredging projects in marine and estuarine environments. **Glenn Grette** is a Principal/Senior Fisheries Biologist with over 28 years of experience in the consulting field. He has extensive experience with CERCLA and Section 404 dredging and disposal projects provides a strong basis for developing strategies for complying with ARAR's during CERCLA alternatives analysis, including the ESA.

JACOBS ASSOCIATES

Jacobs Associates is a consulting engineering firm specializing in design, geotechnical, and construction engineering services, with an emphasis on addressing challenging ground and site conditions. Founded in 1954, Jacobs Associates' staff of more than 165 employees is comprised primarily of engineers with specialized education and practical experience in: geology, geotechnical engineering, soil mechanics, structural engineering, construction engineering,

construction management, and construction disputes avoidance and resolution. Applicable services for the T-117 EAA are similar to our standard suite of temporary works design services, including:

- Geotechnical engineering, exploration, analysis, and design input;
- Excavation support design;
- Groundwater management and dewatering; and
- Retaining walls and ancillary structures.

MOFFATT AND NICHOL

Moffatt & Nichol (M&N) is a full service engineering firm, with primary practice areas that include ports and harbors; coastal, environmental and water resources; urban waterfronts and marinas; inspection and rehabilitation. Since our founding in 1945, we have completed feasibility and modeling studies, cost estimates, and preliminary and final designs for more than 3,000 waterfront projects worldwide. Our services cover the full project life-cycle from planning, field investigation, concept and preliminary design, permit strategy, preparation, and coordination, final designs and PS&E, through the development of RFPs and post-contract support services.

M&N's Seattle office provides a full range of coastal, civil, and structural engineering, planning, and permitting services. The Seattle office is supported by the resources of more than 500 specialists in 26 offices. We provide professional engineering services to both public and private clients for park and recreation projects, shoreline facilities, habitat restoration, site development, highways, and bridges. As a firm, we have planned and designed over 300 marina facilities with 100,000 berths, more than 50 miles of piers and wharves, 500 million cubic yards of dredging, and restored 4,000 acres of wetlands.

For the T-117 project, M&N will be using our knowledge of the Port design/ bid process and waterfront and civil engineering experience to prepare the bid plans and specifications.

ATTACHMENT A – KEY RESUMES

T-117 CLEANUP DESIGN – SEDIMENT AND UPLAND AREA

Grant Hainsworth, P.E., MBA

Principal

Education

MBA, General Management,
2001,
University of Washington

BASc, Civil Engineering
(Water Resources), 1991,
University of Waterloo

Registrations

Professional Engineer
WA

Prior to starting Crete Consulting Inc., Mr. Hainsworth was a Civil Engineer with a large environmental consulting firm with more than 18 years of progressively responsible positions in his field. His primary focus is in civil and environmental engineering. He manages multi-million dollar projects that include investigation, cleanup, and liability management. He specializes in remedial design and implementation for soil, groundwater, and sediment applications, with specific emphasis on redevelopment and site cleanup coordination.

Experience

Former Wood Treating Facility Cleanup and Redevelopment, Washington

Project Manager and Senior Engineer for feasibility evaluations and cleanup at a former wood treating facility located on lakefront in the Puget Sound area. Project required extensive coordination with legal counsel, insurance carriers, consultants, and regulators for cleanup and with architects, transportation engineers, and civil engineers for redevelopment. The \$6 million cleanup of the wood treating site was completed in 2008. The in-water cleanup involved sediment dredging and associated mitigation. The upland cleanup included the use of in situ soil mixing due to geotechnical constraints. Capping of the site was performed in coordination with development of a new headquarters and practice facility for a professional football team.

Owner: Real Estate Developer

Former Asphalt Plant CERCLA Removal Action, Washington

Project Manager and Senior Engineer for a CERCLA time-critical removal action for TSCA-level PCB impacted soil at an Early Action site within the Lower Duwamish Waterway Superfund site. Planning is underway for the non-time-critical removal action that will include sediment and soil removal, capping, and design and installation of intertidal habitat enhancement and public access. Specific issues include a potability determination and an evaluation of the attenuation of groundwater as it discharges to a tidally-influenced surface water. Provided probabilistic cost modeling support to in-house counsel in support of insurance cost recovery negotiations.

Owner: Port of Seattle

Former MGP Urban Park Cleanup and Restoration, Washington

Senior Engineer for upland and sediment cleanup for a former Puget Sound area manufactured gas plant. Much of the work was performed in support of litigation and insurance cost recovery, including development of a probabilistic cost model. The soil and groundwater cleanup consisted of capping, natural attenuation, and air sparging/soil vapor extraction and included shoreline habitat enhancements. This work was performed within schedule and budget and facilitated site reuse. Sediment activities are currently in the investigation and feasibility stage. Sediment cleanup alternatives include removal, capping, and upland disposal.

Owner: Utility

CERCLA Sediment Cleanup Strategy, Washington

Provided strategic consulting support, including evaluation of sediment cleanup alternatives and cost estimates, for an operating chemical plant in the Puget Sound area with CERCLA liability. Sediment was impacted by sludge that contained elevated chlorinated solvent concentrations. Several innovative techniques were considered and cleanup was completed using the recommended approach: dredging with steam stripping treatment and disposal in a nearshore confined disposal facility.

Owner: Chemical Company

Petroleum Cleanup, Washington

Senior Engineer for MTCA Feasibility Study and Environmental Impact Statement at a former refueling facility. Bunker C impacts are being addressed beneath the commercial district of a small town and within wetlands and a nearby river. Cleanup technologies considered and bench tested included surfactant/polymer enhanced flushing and chemical oxidation. Senior Engineer responsible for design of a funnel-and-gate hydraulic containment system, which is one component of an \$80M remedy. Containment system included design of a sheetpile physical barrier, evaluation of geotechnical issues for work along a mainline, design of a groundwater extraction and treatment system, design and construction of precast concrete vaults, and design and bench testing of a GAC reactive media passive groundwater treatment system.

Owner: BNSF Railway Company

CERCLA RD/RA, Montana

Project Engineer for source soil excavation and land treatment at a former wood treating site. Responsible for design documents and reporting, bid documents, and construction oversight of a 14-acre land treatment facility. Source soil excavation included sheetpiling for excavation of a lakefront sludge lagoon and underlying soil. Shoreline restoration was performed in cooperation with the State department of fish and wildlife.

Owner: BNSF Railway Company

Former Petroleum Terminal Cleanup and T-30 Expansion, Washington

Project Manager and Engineer for cleanup of a former Elliott Bay waterfront petroleum terminal. Cleanup included soil excavation and thermal desorption and in situ air sparging and soil vapor extraction for groundwater. The cleanup was performed within budget and schedule constraints and required significant coordination with container terminal redevelopment. Surface water quality standards were achieved within 2 years of starting the groundwater treatment system.

Owner: Petroleum Marketing Company

CERCLA RD/RA, Washington

Project Engineer for multiple design sets of the Harbor Island Soil & Groundwater Operable Unit. Each design set consisted of soil excavation and capping at active industrial facilities. Responsible for design documents and reporting, bid documents, and construction oversight.

Owner: Harbor Island S&G OU PLP Group

CERCLA Feasibility Study, Wisconsin

Prepared sediment cleanup and containment alternatives for the Fox River CERCLA Feasibility Study. The 26-mile stretch of the Fox River and Green Bay contains over 7,000,000 cubic yards of PCB-impacted sediment and estimated cleanup costs range up to \$700 million. Remedial alternatives considered include capping, dredging (mechanical and hydraulic), nearshore confined disposal, confined aquatic disposal, upland treatment of sediment (vitrification, thermal desorption, etc.), and upland disposal.

Owner: Wisconsin Department of Natural Resources

Sediment Cleanup Pilot EPA SITE Demonstration, New York

Field Engineer for a project demonstrating slurry treatment of sediment using sequential biological and chemical oxidation (Fenton's reagent) to degrade PAH that resulted from a former coal gasification plant.

Owner: Niagara Mohawk

CERCLA Feasibility Study, Former Wood Treating Facility, Idaho

Project Engineer for CERCLA Feasibility Study at a former riverfront wood treating facility. Creosote (PAH) impacts were present in the upland, bank, and river of the St. Joe River. Utilized creative regulatory approaches to limit listed hazardous waste generation. Assisted client with a favorable liability buyout by another PLP utilizing an insurance-backed remediation approach.

Owner: Carney Wood Products

Emergency Response and Cleanup, Oregon

Project Manager and Engineer for emergency response and cleanup activities at a 10,000-gallon toluene spill in eastern Oregon. Managed various subcontractors, regulators, and natural resource stakeholders. Cleaned up site within 8 months and had site delisted within 2 years. Successful management of technical and regulatory issues saved the client in excess of \$3 million.

Owner: Class I Railroad

Michael G. Byers P.E.

Principal

Education

MS Civil Engineering,
1991
University of Washington

BS Civil Engineering,
1987, University of
Missouri-Rolla

Certifications

Professional Engineer
WA, OR

Prior to starting Crete Consulting Inc., Mr. Byers was the Lead Engineer for the western region of a large diversified environmental consulting firm and was the Project Manager for one of the regions largest design and construction projects. He served as a regional and national resource for geotechnical engineering support on projects providing geotechnical input on projects both nationally and internationally. Mr. Byers started Crete Consulting in 2010 and continues to provide environmental and civil engineering and construction support on projects in the northwest.

Experience

Active Railroad Yard, Washington

Project Manager, lead design engineer and construction manager for remediation resulting from a historic fueling and maintenance facility in the Cascade Mountains east of Seattle, WA. The project is a multi-year, multi-million dollar petroleum cleanup site that ranks as one of the largest cleanup sites in the state of Washington. Mr. Byers has acted as design engineer, construction manager, lead design engineer and overall project manager for the site during the project, and has been responsible for client contact providing input for liability reporting and project direction, agency contact providing input into consent decree negotiations and periodic deliverables required in the consent decree, and stakeholder contact leading public meetings and discussions with stakeholders. As manager of the project, Mike was in charge of a multi-discipline design team from multiple offices throughout the country and multiple local and national subcontractors required to complete the highly varied scope of work. Mike managed construction of a 700-foot long cement bentonite slurry wall as an interim measure, and the first two years of active remediation construction on the site. Components of the remediation have included moving residential and commercial structures, relocation of major utilities, removal of impacted soil, backfilling and building surface streets, sidewalks and utilities. Key remediation components include a 1,000 foot-long steel sheet-pile barrier wall, large below grade granular activated carbon treatment vaults, a permanent pump and treat groundwater extraction and injection system and an air sparging system. The project also included removal and replacement of a major flood control levee built to limit flooding in the mountain town, and removal and replacement of sediments within a major mountain river containing endangered salmon. The levee replacement included design and construction of a retaining wall, levee planting, and enhancement of fish habitat.

Owner: BNSF Railway

Steel Mill, Oregon

Project manager and lead design engineer for enhancements to the stormwater control system, and for relocation of two large inert material landfills on the active steel mill property. Stormwater enhancements included construction of three deep wet wells, 42-inch diameter steel stormwater conveyance lines, 4, 100 horsepower stormwater pumps, two chemical feed system to facilitate solids removal, settling pond and outfall to the nearby river. The chemical dosing and mixing is operated by a fully automatic controller system that operates the pumps and mixing operations. The stormwater system was constructed by the steel mill as a source control measure to capture and treat the full 100-year storm event. Mr. Byers was also the Project Manager and Lead Engineer for modifications to two landfills on the

property required to facilitate rail routing to the new pipe rolling mill that was constructed on the site in 2007-2008. Landfill relocation included development of designs for permit submittals, obtaining the required permits from the agency, removing a small wetland on the property, assisting the owner with bidding and contractor selection, and construction monitoring. Landfill construction included moving 160,000 cubic yards of landfill material, and covering the landfills with a low permeability geosynthetic clay liner and topsoil to enhance vegetation growth.

Owner: Confidential

Former Oil Refinery, Wyoming

Provided geotechnical input for design and construction of about 7,000 lineal feet of driven sheet-pile installed around portions of the refinery as a groundwater migration barrier. Involvement in the CERCLA project began during alternative technology evaluation when Mr. Byers designed and led a sheet-pile test program conducted at the site to evaluate the feasibility of driving sheet piles in the loose to dense alluvial site soils. River bank stability analyses were performed to determine barrier wall setback distances from the river, and to evaluate varying cut/fill and construction scenarios for the wall. Provided QA/QC during construction of the barrier wall, and developed and monitored a pressure-grouting program in two areas on the site where driving difficulties precluded pile penetration to the desired elevations. Mr. Byers also provided geotechnical input and evaluation of data developed during a pilot test capping program where thin-lift capping was utilized to place a sand cap over very soft compressible process waste sediments.

Owner: British Petroleum

Sediment Cleanup, Seattle, Washington

Slip 4 has been named as an early action cleanup area on the Lower Duwamish Waterway Superfund site in Seattle, Washington. The CERCLA cleanup includes removing PCB impacts in site sediments and impacts in the river banks surrounding the slip. The project was designed but implementation was delayed three years while potential upstream sources for impacted stormwater were addressed. Mr. Byers is providing Civil and Geotechnical engineering design support, support for access agreements, and support for the City of Seattle risk analysis and mitigation determination for the work.

Owner: City of Seattle

Former Wood Treating Facility, Washington

Lead engineer for construction and design engineer for remediation and development of a portion of a former wood treating facility in Washington. Design work involved temporary erosion and sedimentation control, surface water feature design and control, preparation of construction documents, bidding and evaluation, and construction monitoring. Lead engineer for construction of the remediation involving removal of impacted sediment after hydraulically isolating a submerged cove, deep soil mixing using cement and bentonite as additives, removal and demolition of tank foundations, removal and demolition of underground product lines, and removal of hotspots where elevated impacts were encountered. Reconstruction of the cove area included construction of a partially submerged wetland and an upland forested wetland to replace habitat that was modified during remediation. Site has been developed as a Brownfield site and is now a training facility for a professional football team.

Owner: Confidential

Manufactured Gas Plant Sediment Remediation, Washington

Lead geotechnical engineer for evaluating geotechnical aspects of sediment remediation for a confidential client in the greater Seattle area. The geotechnical evaluation was completed to determine the feasibility for capping sediments on the underwater slopes leading from the uplands and on the relatively flat channel bottom. Sediment on the site is extremely soft and capping was originally thought to be extremely difficult. A sediment evaluation program was design and completed to evaluate capping and consolidation of the very soft sediments. Explorations included drilling and sampling, cone penetrometer testing, insitu vane shear testing, and insitu plate bearing tests that were completed on the insitu sediment surface by divers. Geotechnical considerations on the site included sediment and cap stability on the slopes, cap and sediment stability during and after capping and determining sediment capping rates to result in a stable system.

Owner: Confidential

Jamie C. Stevens, P.E.

Senior Environmental Engineer

Education

BS, Environmental Engineering,
2002,
North Carolina State University

Registrations

Professional Engineer
WA

Ms. Stevens has more than 9 years of experience in environmental consulting. Her primary focus is project management and remediation design at soil, groundwater, sediment and vapor sites. She has experience with designing and implementing site investigations and site cleanup actions. She has professional experience in several areas of remediation engineering, including enhanced reductive dechlorination, natural attenuation of chlorinated and petroleum hydrocarbons, air sparging/soil vapor extraction, groundwater extraction, sediment capping and soil stabilization. She has worked with a number of state and federal agencies to negotiate and design site remedial investigations, develop conceptual site models, design remedial actions plans, and compliance monitoring plans. Ms. Stevens has experience working on chlorinated solvent and petroleum hydrocarbons sites, polychlorinated biphenyl (PCBs) sites, metal sites, former manufactured gas plants (MGP's), and wood treating facilities.

Experience

Former Aircraft Engine Assembly Facility, Washington

Project Manager and Senior Engineer for MTCA remedial investigation, feasibility evaluation and cleanup at a State-lead former facility with chlorinated solvent contamination present in the groundwater, soil, and vapor. Project required the preparation of a cleanup action plan which identified chemical oxidation treatment as the primary treatment technology for chlorinated solvents contamination present in groundwater. Project also required the preparation of a remedial investigation and feasibility study which included an evaluation of different remedial alternatives and the design and construction of interim groundwater containment and vapor mitigation systems. The project required a detailed evaluation of the indoor air environment, including modeling and real time soil vapor and indoor air sampling. The project required extensive coordination and negotiations with the state agency, current site owner, former site owner, and downgradient property owners.

Owner: Manufacturing Company

Former Asphalt Plant CERCLA Removal Action, Washington

Project Engineer for a State-lead and CERCLA site for TSCA-level PCB impacted soil at an Early Action site within the Lower Duwamish Waterway Superfund site. Supported the development of a feasibility study and engineering evaluation/ cost analysis, benefit analysis, remedial alternative cost analysis, and data analysis for upland portions of project. Provide support for regulator strategy between federal and state agencies. Responsibilities also include managing reporting, field work, and data management for ongoing routine monitoring and compliance. Planning is underway for the non-time-critical removal action that will include sediment and soil removal, capping, and design and installation of intertidal habitat enhancement and public access.

Owner: Port of Seattle

Aerospace Manufacturing Facility, Washington

Project Manager and Senior Engineer for the remedial investigation of a facility with chlorinated solvent contamination present in soil, groundwater, and vapor. Project included the design of an interim vapor mitigation system for three large industrial buildings, completed a remedial investigation for all affected site media. This work was completed under the WA State Voluntary Cleanup Program. The project required extensive coordination and negotiations with the current site owner, former site owner, and legal team.

Owner: Aerospace Company

Active Steel Mill, Oregon

Project Engineer for State-lead and CERCLA site, providing support and assisting in the development of a source control and site closure activities and overseeing sediment remedial investigation and feasibility study activities at an active steel mill located adjacent to a CERCLA sediment cleanup site. Assisted in the development and implementation of groundwater, soil, and near shore sediment investigations and reporting. Provided engineering support on a riverbank soil stabilization design addressing impacted soil migration.

Owner: Steel Mill

Former Manufactured Gas Plant Sites, Wyoming, Florida, and Georgia

Staff Engineer for several remediation projects at multiple former manufactured gas plant (MGP) sites. Supported project through review of technical specifications and design drawings data interpretation, design assistance, document preparation, and cost estimation. Developed groundwater monitoring plans which included: natural attenuation; non-aqueous phase liquid; and surface water monitoring.

Owner: Oil Companies and Utilities

Inactive and Active Wood Treating Facilities, Alabama, Florida, Maryland, North Carolina, South Carolina, Virginia, and Washington

Staff Engineer for several inactive and active wood treating facilities. Responsibilities included developing groundwater monitoring plans, groundwater and stormwater monitoring and management, and operations maintenance of groundwater recovery systems. Responsibilities also included stormwater modeling, assisting in the development of as-built map of current storm sewer system connections and provided recommendations for improvements to the storm sewer system. Developed and help implemented best management practices across the sites and lead numerous events audited by federal and state regulators.

Owner: Wood Treaters

Active Petroleum Refinery, California, Virginia, and Washington

Staff Engineer for several petroleum refineries. Responsibilities included assisting in extensive groundwater and soil investigations, oversight of remediation activities, assisting in the design of remediation systems to treat isolated spill areas, and various reporting and compliance monitoring reporting.

Owner: Oil Companies

Risk Assessment and Soil Investigation, North Carolina and South Carolina.

Staff Engineer for several utilities and chemical manufactories. Responsibilities included assisting with the risk assessment, soil investigation design, implementation and reporting.

Owner: Various Utilities and Chemical Manufactories

Cost Recovery and Project Oversight

Supported various clients on work related to cost recovery and grant funding; reviewing cost estimates; reviewing third party technical documents; and providing third party oversight for investigation and cleanup activities.

Environmental Health and Safety

Served as the Health and Safety officer for a large environmental consulting company for two years. Responsibilities included the implementation and oversight of the company health and safety program, site audits, preparing and performing training presentations, and records management.



RESUME

Gregory L. Hartman, P.E.
Hartman Associates, LLC

Mr. Hartman has over 40 years experience in coastal and river engineering, dredging and disposal. He has focused on Port channel and waterway development, and environmental engineering for sediment remedial design. Project highlights include:

- Completion of the emergency design, environmental clearance and contract documents for dredging and disposal of 8 million cubic yards of fine volcanic ash sediment from the Columbia River 40 foot navigation channel that was deposited overnight following the eruption of Mt. St. Helens (1980),
- Completion of the engineering design, plans and specifications, and contract oversight of the first sediment capping remediation project successfully completed pursuant to CERCLA regulations. (Simpson Tacoma Kraft Mill, 1988),
- Hartman Associates received the Engineering Excellence Award for the Sitcum, Blair, Milwaukee Waterway Project from the Consulting Engineers Council of Washington (Port of Tacoma, 1998)
- Project Manager and design lead for the first successful placement of a thin cap at water depths of 120 to 150 feet in Wards Cove (Ketchikan, AK 2002)
- Technical design lead and construction oversight at the Thea Foss Waterway for the first successful hard cap (plastic) placement. (Tacoma, WA 2005).
- Technical and Peer Review for: New Bedford Harbor Remedial Design Technical Review (2001) Columbia River Channel Design Technical Review and Cost Analysis (2005), Fox River Remedial Design Technical Review (2006), Hudson River Phase 1 Peer Review (2010).

Mr. Hartman's project experience with the Pacific Northwest regional Ports, public and private owners, includes Consultant responsibility in all phases of preliminary through final design and construction oversight. A majority of these projects have required implementation of additional sampling and/or lab analysis to fill data gaps and complete final design confirmation. This includes water quality sampling, sediment sampling (surface and subsurface), sediment physical characterization, structural surveys, and the use of manual, single beam and multi-beam hydrographic surveys. He has worked with owners in developing the list of specific information requirements, and then obtaining that information as necessary.

Mr. Hartman has extensive experience with Advertisement/Solicitation and Contractor Bid/Award for public and private owners. Included in this activity are the cost estimating for the preliminary design and budgeting, and final cost estimates for contract bid and award.

Mr. Hartman has provided services and is experienced in Construction Oversight, both as an inspector on site and as Construction Design and technical support. He has prepared Daily, weekly and Monthly Reports, project progress surveys, and Post Construction Reports. He has been responsible for contracting of support services under the approval of the owner.

Mr. Hartman has provided the engineering and construction expertise for navigation and remediation dredging, disposal and capping throughout the USA. He has also completed navigation design, dredging and disposal projects overseas that included Shoreline Dredging Development for diamond harvest (Namibia), Dredge Plant Evaluation for Excavation of Mineral Sands (Australia), Improvement of the Navigation Channel in the Sudd Reach of the White Nile River, (Sudan,). Dredging and disposal plans and specifications following the eruption of Mt Pinatubo (Philippines), Entrance Channel, Jetty and Turning Basin design (Nicaragua, New Guinea), River Navigation Studies and channel improvements (Malaysia, Argentina, Paraguay, Pakistan, Indonesia).

Mr. Hartman has been an instructor for the U.S. Army Corps of Engineers primary training program on dredging, *Dredging Fundamentals*, since 1985. He was the Western Dredging Association (WEDA), President (1996-1999), Chairman of the Board (1999-2002), a member of the World Dredging Congress Executive Committee (WODCON), and is presently a Member of the Board for WEDA.



REGISTRATIONS/CERTIFICATIONS

Professional Civil Engineer, 0025544, WA (1988)

Professional Civil Engineer, 7365, OR (1972)

EDUCATION

BS, Civil Engineering, Oregon State University, 1968

MSCE (Major: Coastal/River Hydrodynamics, Minor: Business), Oregon State University 1976

REPRESENTATIVE PROJECT EXPERIENCE

Corps of Engineers Dredge Curriculum; 1982 – Present.

Cleveland Harbor Dredging & Disposal Summit, OH

Thea Foss Waterway Remediation,

Wards Cove Remediation Design and Construction, Ketchikan Pulp AK.

Comprehensive Evaluation of Alternatives for Greens Bayou, TX -

Lake Apopka Cap Demonstration Project SJRWMD, FL

Hudson River Peer Review, NY:

Sebastian River Muck Removal Project, FL

Texas City Terminals, Texas City, TX.

Peer Review, Benefit and Cost Analysis of Columbia River Channel Improvement, OR

San Pablo Bay Aquatic Rehandling Facility, CA

Fox River Technical Review for Remedial Design, WI

New Bedford Harbor PCB Remediation, MA

Disposal Area Management Plan, DOW Chemical, Freeport, TX

Nearshore Fill Study, Port of New York/New Jersey NY

Mohawk River Remediation, Niagara Mohawk, NY

Mt. St. Helens Eruption: Cowlitz-Toutle-Columbia River 50 Year Dredge & Disposal Plan – WA, OR

Standards for Confined Disposal of Contaminated Sediments, WA

Feasibility Study, Coney Island Creek, NY

Hylebos Waterway Superfund Sediment Remediation Project, Tacoma, WA

Sitcum Waterway Remediation, Blair Waterway Dredging, and Milwaukee Waterway Fill and Mitigation Project, Tacoma, WA

Dredge Lake Remediation, Memphis, TN

Simpson Tacoma Kraft-St. Paul Waterway Remedial Action Plan, Tacoma, WA

U.S. Navy Everett Homeport, Puget Sound, WA -

Lockheed Marine Sediment Remediation Plan, Seattle, WA

Port of Everett, Stage I Marine Terminal Improvements, Everett, WA

Alcoa Grasse River PCB Remedial Options Plan Study, Massena, NY

International Projects

Sumatra Island Waterways, Jakarta, Indonesia

Deep Draft Channel Development, Port of Corinto, Nicaragua

Overburden Removal for Diamond Mining, CDM, Namibia, Africa

Hydrovia Channel Design & Dredging, Argentina & Brazil

White Nile River Navigation Channel Development and Stabilization, Sudan, Africa

Navigation Study on the Indus River, Pakistan

Pampanga Delta Waterway, Post Eruption of Mt. Pinatubo, Luzon, Republic of the Philippines

Feasibility of Dredging the Entrance Channel, Port Amamapare, Papua New Guinea

Dredge Plant Evaluation for Excavation of Mineral Sands, Eneabba, West Australia

GLENN GRETTE, SENIOR BIOLOGIST, PRINCIPAL

M.S., Fisheries, University of Washington

B.S., Zoology, Washington State University

Glenn Grette is a Senior Fisheries Biologist with over 27 years of experience in the consulting field in fisheries ecology, habitat restoration and mitigation, impact assessment, permitting, and Endangered Species Act (ESA) compliance. Mr. Grette has been involved from initial strategy development through remedial design, construction, and post-project monitoring on major CERCLA sediment remediation actions in Commencement Bay and MTCA actions elsewhere in Puget Sound. Mr. Grette has also managed or supported permitting, environmental review and ESA compliance for numerous large-scale in-water development projects for Puget Sound Ports. He has had a substantial role in permitting over twenty large-scale dredging projects in marine and estuarine environments. His extensive experience with CERCLA and Section 404 dredging and disposal projects provides a strong basis for developing strategies for complying with ARAR's during CERCLA alternatives analysis, including the ESA.

Mr. Grette's extensive experience with design, implementation, and monitoring of large-scale estuarine and marine habitat mitigation actions provides a unique perspective for addressing habitat issues related to mitigation, Natural Resource Damage Restoration, and salmon recovery as part of CERCLA remediation. He has developed major mitigation actions ranging from excavation of upland to create tidal marshes to placement of large volumes of dredged material (up to 1 million cubic yards) to build intertidal beaches.

- **Former Scott Paper Mill Cleanup Project, Port of Anacortes, WA.** Mr. Grette led all elements of this MTCA remediation project related to the impacts on aquatic habitat and related mitigation, and led federal permitting and ESA compliance. The project entails unavoidable impacts to intertidal and shallow subtidal habitat including impacts to approximately 1.4 acres of eelgrass. Mr. Grette conducted detailed eelgrass, macroalgae, and wood waste surveys at the project site, assessed the habitat impacts of the project and developed a conceptual mitigation action to address those impacts. The final remedial action provided enough on-site opportunities for habitat mitigation and for addressing Natural Resource Damage (NRD) habitat restoration liabilities. The final design of the mitigation and NRD restoration actions were conducted in conjunction with the project engineer. Permit applications were submitted in February 2009. Federal permits for the project have been issued and construction began in August 2009.
- **Mouth of Hylebos Waterway Remedial Action, Glenn Springs Holdings/Port of Tacoma, WA:** Mr. Grette managed the preparation of the Mitigation Plan and Biological Assessment for this sediment remediation project that included dredging and disposal of contaminated sediments in a nearshore disposal site. Use of this site converted 13 acres of aquatic habitat to upland. The consultations addressed impacts, mitigation, and sediment remediation. Project construction has been completed including placement of 350,000 cubic yards of clean dredged material to build aquatic habitat mitigation.
- **Hylebos Waterway Remedial Action Head of Hylebos Cleanup Group, Atofina Chemicals, General Metals of Tacoma, Port of Tacoma, WA:** Mr. Grette evaluated the project impacts, and prepared the Biological Assessment for the CERCLA remediation of Hylebos Waterway in Commencement Bay. He contributed to dredging designs which minimized the need for

compensatory habitat mitigation resulting from the remedial dredging. He also led the ESA consultations. Construction has been completed.

- **Sitcum Waterway Remediation Project, Port of Tacoma, WA:** Mr. Grette managed the portion of this CERCLA project that evaluated the habitat impacts of cleanup of contaminated sediments from Sitcum and Blair Waterways and disposal of the sediments in the Milwaukee Waterway nearshore disposal site. Mr. Grette developed mitigation actions and prepared a Mitigation Plan to offset the impacts of converting over 20 acres of aquatic habitat to upland. Dredging was conducted on over 300 acres of aquatic habitat, yielding approximately 2.5 million cubic yards of dredged material. The mitigation actions included construction of the Milwaukee Habitat Area in Commencement Bay by placement of approximately 1 million cubic yards of dredged material. The remediation project is complete.
- **Skykomish River Levee Remediation, Burlington Northern Sante Fe railroad – subcontract through RETEC, Sykomish, WA:** Mr. Grette provided expertise on the impacts of remediation of a petroleum contaminated levee along the Skykomish River in Washington pursuant to Washington's Model Toxics Control Act and the Clean Water Act. He led evaluation of construction impacts, preparation of a Mitigation and Monitoring Plan, and ESA compliance. Construction was completed in 2008.
- **Evrax Oregon Steel Shoreline Remediation - Subcontract through AECOM, Portland, OR:** Mr. Grette is leading the impact assessment, mitigation planning, and ESA compliance for this shoreline remediation project along the Willamette River in Portland Oregon. The project is a voluntary action under Oregon's Department of Environmental Quality's regulatory authority. The site has a future CERCLA component downslope of the shoreline. The primary challenge of the project is containing eroding contaminated sediments while providing positive features for salmon rearing habitat to address ESA concerns. Review of the project is ongoing.
- **Dakota Creek Shipyard, Port of Anacortes, WA:** Mr. Grette led permitting, ESA compliance, and habitat mitigation and monitoring efforts for Project Pier 1, the expansion of the Dakota Creek Industries shipyard. The project entailed substantial impacts to eelgrass, permitting of a new 50-foot high in-water bulkhead (or seawall), and fill of one acre of waters of the U.S. The mitigation action included construction of an eelgrass bed in Fidalgo Bay and incorporated more mitigation than required for the project. An innovative approach was used to assign excess mitigation credit to the impacts of future Port of Anacortes projects. Construction completed in 2009.
- **Fidalgo Bay Eelgrass Site, Port of Anacortes, WA:** Mr. Grette led the permitting, mitigation planning, conceptual design, and agency negotiations at the Fidalgo Bay Eelgrass Site, which was planned as compensatory mitigation for The Port of Anacortes Project Pier 1 Redevelopment. The site utilized dredged materials from other Port projects to develop a 4-acre habitat site in an un-vegetated area in Fidalgo Bay. The site provided more mitigation credit than was needed for Project Pier 1. The excess mitigation credit was captured in an agreement with Washington Department of Fish and Wildlife, pursuant to RCW 90.74, so that it could be applied to future projects. Construction was completed in 2007.

SUMMARY

Mr. Pita is a Technical Engineer / Task Manager with extensive experience in geotechnical related environmental and port development projects. His background in both geology and civil engineering gives him a unique perspective for managing geo-oriented investigations, feasibility studies, designs, and the construction implementation of these designs. Mr. Pita's 30+ years of experience gives him the practical knowledge necessary to solve complex subsurface problems.

PRINCIPAL AREAS OF EXPERTISE

- Bulkhead / Cutoff Wall Design
- Foundation and Earthwork Design
- Shoring / Underpinning / Soil Nailing & Retaining Wall
- Groundwater Collection & Dewatering Systems
- 'Clean-up' & UST Design and Construction
- Synthetic Liner Design & Construction Monitoring

EXAMPLE RELAVANT PROJECTS

Environmental Cleanup

- Principal-in-Charge of the Port of Seattle's On-Call Environmental Task Order Contract while with my former employer. Major task orders under this contract include a Focused RI/FS at the Terminal 106 Transload Dock to define the extent of lead, arsenic and chromium in soils beneath the terminal, and an investigation of potential fuel contamination at a fuel farm within the General Aviation area to establish costs for remediation to support the Port of Seattle's long-term remedial planning.
- Managed the construction of a methane extraction, monitoring system and cap of the closed Interbay landfill, which is the site of a new golf course. The construction required rapid mobilization and strong construction management on very short notice, so offsite gas leakage could be controlled.

Waterfront Structures & Beach Area Work

- Manager of dewatering task analysis for expansion design of the West Point treatment plant, Seattle, WA. Project entailed drilling test wells, pump tests, analysis, and computer modeling of construction scenarios of the 500 by 2,000-foot excavation which would be 20 feet below the water table.
- Performed a geotechnical pile capacity analysis for the existing berths at the Port of Anchorage, Alaska. Study provided data relative to whether existing piles could carry a heavier container crane load.
- Geotechnical engineering design and construction monitoring; Terminal 37 and 46 modificatoin Port of Seattle, Washington. Eighty-six-acre container handling facility included construction of a 1/2-mile-long pile-supported apron, 6 million tons of fill, site layout, demolition design, and extensive monitoring of potentially unstable soils. 'Pile dynamics' was utilized to size the piles, decide on the number, and define their capacity. Slope indicators were used to evaluate the movement in the fill during pile driving.
- Managed and designed Terminal Two site development in Port Angeles, Washington. Proposed development will contain both on and offshore pile-supported structures over random harbor fill and intertidal sediments.
- Design of breakwater and bulkhead structure on Admiralty Island, Alaska. Proposed log handling facility will include filled staging area and pile-supported bulkhead.

- Project Manager for geotechnical phase of port facilities construction at Yakutat, Kaasan, and Hydaburg, Alaska. These projects included pile load tests, dynamic pile monitoring, and installation of tendon-anchored piles.
- Geotechnical engineering for private marina in Anacortes, Washington. The design required the installation of 3,000 piles which act as a breakwater.
- Comprehensive design of 1,000-slip marina at Point Roberts, Washington, included recommendations for piles, breakwater construction, and dredging of over 1 million yards of material.
- Preliminary study of petroleum products pier in Cook Inlet, Alaska. Design considerations included winter ice flow protection and 40-foot tidal changes.
- Geotechnical analyses of distressed marina in Gig Harbor, Washington. Bulkhead failure during construction led to subsequent evaluation of original design as well as dredging and construction procedures.
- Design recommendations for two coastal slope stability projects in the Purdy, Washington area.

Outfalls

- Geotechnical engineering for outfall in over 150 feet of water at Valdez, Alaska. Extremely sensitive soils and steeply dipping bottom topography were the major design considerations.
- Geotechnical review of the outfall into the Strait of Juan de Fuca for the city of Victoria, B.C. (Canada). A critical design element accounted for swift bottom currents and subsequent scouring of pipe cover.
- Outfall design of ITT Rayonier facility in Grays Harbor, Washington. Design called for pile-supporting the outfall beneath the river bottom.
- Geotechnical analyses for sewage treatment facility's outfalls in Centralia, Ellensburg, Wenatchee, and Port Angeles, Washington and Pago Pago in the South Pacific.
- Subsurface investigation and geotechnical analyses of outfall at Kenai, Alaska. The diffuser had to be deeper than the potential ice scouring depths.

EDUCATION

- M.S. CE, Oregon State University, 1974
- M.S. Geology, University of Tulsa, 1972
- B. S. Geology, University of New York, 1969

PROFESSIONAL REGISTRATIONS

- Prof. Engr. (Civil); AK, NY, UT, ID, WA
- Prof. Engr. (Geotech & Environmental); OR
- Professional Geologist; ID, WA

PUBLICATIONS

Mr. Pita has published over 25 technical papers and articles on geotechnical and geotechnical / environmental engineering.



Summary

Kerston Swartz has over thirteen years of public sector and non-profit experience in the greater Puget Sound area. Dovetailing well with her career in outreach and community relations, a recently earned graduate degree in public administration complements Kerston's strengths in project management. She is a skilled relationship-builder and strives to establish partnerships among diverse constituents. Kerston is a strong and effective communicator, verbally and in writing, with an ability to synthesize technical information for all to understand. Kerston works hard to manage the complex needs of all stakeholders, whether on the job site or in the boardroom. Currently, Kerston works on the Everett Smelter Cleanup Project, Fremont Siphon Sewer Project, and the Terminal 117 Cleanup Design located in South Park, Seattle.

Education

University of California, Davis
B.A. Communications, Psychology minor, 1992

University of Washington
Master of Public Administration, 2007

Project Experience

Terminal 117 Cleanup Design **Port of Seattle**

Work as public involvement team member on the Port of Seattle's Terminal 117 cleanup design project in the Lower Duwamish. Develop Public Involvement Plan, update T117.com public information website, and attend community events and briefings. Work with the community and stakeholder groups to provide project updates and outreach materials.

Everett Smelter Cleanup **Department of Ecology, State of Washington**

Conduct outreach and community relations for the cleanup of a former smelter site located in Everett, Washington. Work with residents and business owners to mitigate construction impacts and obtain property access agreements. Design communication materials and coordinate public events to inform community of upcoming construction and future plans for onsite cleanup.

Lower Duwamish Paint-Sampling Project **Department of Ecology, State of Washington**

Coordinate resident, business and commercial participation in paint-sampling survey by securing access agreements, answering questions and concerns and visiting participants. Design outreach materials including informational brochure and thank you letter. Manage and update database tracking public involvement and approvals to access properties.

Fremont Siphon Sewer Project

King County

Execute community relations efforts and support for King County's Fremont Siphon project. Engage local stakeholder groups, including Seattle Pacific University, Seattle Parks, businesses, residents, and recreation users, through various outreach strategies. Organize and staff public meetings; create and distribute flyers, fact sheets, and posters within community. Implement Public Involvement Plan and identify community issues for alternatives analysis. Conduct neighborhood business and resident survey.

Gateway West Transmission Line project

Idaho Power and Rocky Mountain Power

Handled public communications, updated database records, and entered coded comments. Prepared weekly comment summaries with suggested responses and helped coordinate quarterly BLM comment submittals. Responsible for public meeting logistics, venue coordination, materials production and schedule for accomplishing tasks leading up to the meeting. Tracked meetings on outreach schedule and participate in weekly conference calls and internal coordination meetings. Helped manage project archiving and public record by posting materials to internal document sharing site. Coordinated and sent right-of-way letters to landowners. Created materials and documents.

Madison Valley Stormwater Project

Seattle Public Utilities

Provided construction outreach efforts for Phase 2 of the Madison Valley Stormwater Project. Developed materials including frequently asked questions, email alerts, and notification flyers. Communicated with business owners, residents, SPU project managers, and City contractors regarding neighborhood inquiries and construction impacts. Managed a 24-hour project hotline and email account and responded to community questions, comments, and concerns.

CONTRACTOR QUALIFICATIONS – T-117 CLEANUP DESIGN - STREETS AND YARDS

INTRODUCTION

The City has retained one contractor (consulting: Integral Consulting Inc.) to perform the Lower Duwamish Superfund Site Terminal 117 Early Action Area (T-117 EAA) Scope of Work for the Adjacent Streets and Residential Yards areas. Integral will also provide oversight of the scope of work being performed by the Port for Uplands and Sediments areas. Integral is using four subcontractors (sub-consultants to Integral: Northwest Environmental Solutions, Terracon, J.A.Brennan & Associates, and Harris & Smith Public Affairs).

As required in Section VII, Section 10 of the Administrative Settlement Agreement and Order on Consent (ASAO), the qualifications for each of these firms are provided below.

Integral Consulting

Integral offers a broad range of engineering expertise to support all phases of remediation and development projects, from project planning through final design and construction. Our team is recognized for developing practical remedies for contaminated soil, sediment, and groundwater. Our success is based on efficient integration of site data, chemical fate and transport characteristics, and risk-based principles to develop cost-effective solutions that are practical and minimize long-term environmental liability.

Highly regarded for their expertise in characterizing and remediating contaminated soil, sediment, and groundwater, Integral's scientists and engineers have conducted numerous cleanups at industrial, port, municipal, and mining facilities, many of which involved multiple contaminants, complex migration pathways, and serious environmental risks. Our approach draws on a broad knowledge of investigation techniques, contaminant fate and transport, and focused feasibility evaluations, incorporating both prudent remedial strategies and risk-based cleanup objectives.

Key T-117 team members include:

Reid Carscadden, Principal-in-Charge, is a professional engineer with more than 25 years of broad technical experience in support of environmental remediation, geotechnical, and civil engineering projects. Mr. Carscadden has led or served in a key role on numerous multifaceted remediation projects at industrial waterway and upland facilities, from the initial remedial investigation and feasibility study (RI/FS) phase, through final design and construction. He has a strong working knowledge of the CERCLA process and related cleanup regulations in several states across the country. Mr. Carscadden assists clients with

strategic planning, coordination with stakeholder groups, and negotiations with regulatory agencies in development of cleanup action plans, permitting, and project implementation. He also provides expert services in support of environmental remediation and construction-related litigation and cost allocation assignments.

Eric Pilcher, Design Lead, is a professional civil engineer specializing in land planning, brownfield redevelopment and stormwater management. He has 14 years of experience in preparing designs for site and infrastructure improvements on projects ranging in size from 1-acre outparcels to 100-acre campuses. Design elements include demolition, roadway alignment, access and site layout, earthwork and fine grading, storm and sanitary sewers, water distribution, erosion and sediment control best management practices (BMPs), and storm water conveyance, quality treatment, and flow control. In addition to design, Mr. Pilcher has substantial experience in project management and construction contract administration. Management duties include permit coordination, preparation of construction specifications, cost estimating, review of bids, review of submittals, response to requests for information, field observations, and generation of punch lists.

Randi Wexler, Regulatory Lead, has more than 25 years of experience as a regulatory specialist, with strong proficiency in regulatory affairs, environmental management system development, litigation support, compliance auditing, property transactions, and permitting. In addition, she develops strategies, implements plans, and negotiates with agencies. Ms. Wexler has extensive experience with port and industrial projects, and she is responsible for analyzing and interpreting regulations, and for conducting inspections for compliance with RCRA, SARA, TSCA, FIFRA, CAA, and CWA. For clients in many states, Ms. Wexler acts as client manager, inspecting tenant operations for regulatory compliance and interfacing with local, state, and federal agencies during the inspection and permitting process.

Jane Sund, CQA Field Lead, is an engineer with 6 years of professional experience in the environmental field. Ms. Sund has considerable experience conducting site investigations, providing construction oversight, and in-water cap design. Since joining Integral in 2004, Ms. Sund has been involved in numerous field sampling events supporting the Portland Harbor RI/FS. She has extensive experience conducting sediment, surface water, stormwater, groundwater, and soil investigations in upland, freshwater, and estuarine environments. She was also responsible for preparing work plans, sampling and analysis plans (SAPs), budgeting, and coordinating with consultants, subcontractors, and clients. Ms. Sund has performed slope stability analysis using WinSTABL software as part of cap design analysis. She has also prepared technical specifications for construction including but not limited to sediment capping and dredging and excavation specifications. Ms. Sund worked with a team in developing a construction quality assurance plan, water quality management plan, and sediment SAPs as part of design analysis report. Ms. Sund served as field team leader in the collection of sediment cores and surface grabs for geotechnical analysis, and collection of seep water samples for water quality analysis.

Deborah Rudnick, BA / Permitting, is an ecologist specializing in the design and execution of complex ecological investigations in upland terrestrial, freshwater, estuarine, and marine environments. In her 15 years of professional experience, Dr. Rudnick has conducted research in population ecology, behavioral and trophic ecology, and invasion biology. She has designed and conducted stable isotope analyses and experimental mesocosms to investigate aquatic food webs. She has implemented research and monitoring of upland terrestrial, riparian and aquatic systems involving biological inventories, riparian restoration, geomorphological studies, macroinvertebrate sampling, water quality monitoring, evaluation of pharmaceutical products in the marine environment, and instream improvements for fish and wildlife habitat in a diverse range of geographic regions. Dr. Rudnick has designed exposure models and conducted ecological risk assessments for wood processing facilities, arid upland mining sites, shipping facilities, and urban estuaries. She has conducted site assessments to meet regulatory guidance including biological assessments, essential fish habitat assessments, terrestrial ecological evaluations (TEEs) under the Washington State Model Toxics Control Act (MTCA), and site evaluations under various state-level regulatory programs in Oregon, Colorado, Washington, and Nevada. Dr. Rudnick has provided leadership on research and management teams addressing invasive species and ecosystem health.

Northwest Environmental Solutions

Nick Varnum, Investigation Lead, is a registered professional geologist with more than 20 years of experience in the assessment of hydrogeology, aqueous geochemistry, and transport and fate of chemicals in hydrogeologic systems. He specializes in managing complex sites and environmental issues for clients with multiple sites and projects with multiple stakeholders, and has provided comprehensive services from initial site research and historical reviews through site characterization and analysis of remedial options and,

ultimately, to the design, construction, and implementation of final corrective actions. His technical expertise also includes a variety of engineering geology projects including geotechnical assessments, design of major earthwork structures such as heap leach pads and tailing dams, static and dynamic slope stability evaluations, seismic studies, geological hazard assessments, erosion and sedimentation studies, watershed assessments, and water supply development.

Accomplished at developing innovative approaches for site characterization and strategies for negotiating streamlined site closures with regulatory agencies, Mr. Varnum has directed projects in the Oregon Department of Environmental Quality (DEQ) Voluntary Cleanup Program underground storage tank (UST) cleanup, site response, and site assessment sections, and he has had direct involvement in successful agency negotiations with California Regional Water Quality Control boards, the Washington State Department of Ecology (Ecology), EPA Region 10, and other state and EPA regional jurisdictions. He has managed the investigation and cleanup of hazardous waste sites in the Pacific Northwest, Alaska, Hawaii, and Eastern Europe.

Mr. Varnum has experience addressing soil and groundwater contamination issues at sites affected by a range of chemicals that includes petroleum hydrocarbons, creosote, pentachlorophenol, trichloroethene, tetrachloroethene, other chlorinated solvents, pesticides (including DDT and 2,4-D), polychlorinated biphenyls (PCBs), dioxins and furans, and metals. He has provided environmental consulting services to a wide variety of clients including major oil companies, convenience store chains, major industry, mining companies, seafood processors, real estate developers, insurance companies, municipalities, county and federal agencies, and regulatory agencies (Oregon DEQ).

Terracon

Terracon Consultants, Inc. is a dynamic and growing consulting firm providing multiple related service lines to clients at local, regional, and national levels. Since 1965, the employee-owned firm has provided consistently high value and attention to client needs. Their services include Geotechnical, Environmental, and Construction Materials Testing and Special Inspections.

After operating in the Seattle area (now in Mountlake Terrace), Bellevue, and Tacoma, Washington and Portland, Oregon since 1998, Zipper Zeman Associates, Inc. joined Terracon in 2005. In 2009 Terracon also established a Construction Materials Testing and Special Inspections group, complementing their geotechnical and environmental engineering services. The entire group is now part of the corporate Terracon, with over 100 offices nationwide.

John Zipper, Geotechnical Engineer, has a BS degree in Civil Engineering from the University of New Hampshire and is a licensed Professional Engineer in Washington and

Idaho. He has completed numerous geotechnical design and evaluation projects nationwide, with emphasis in the Pacific Northwest. Mr. Zipper has worked for geotechnical engineering consulting firms in the Seattle area since 1979, in positions advancing from field and design engineering to manager of interdisciplinary project scopes, budgets, and technical quality. His project engineering experience encompasses a broad range of geotechnical and environmental engineering conditions.

Mr. Zipper has extensive geotechnical engineering experience on highway and road construction and rehabilitation projects. Projects include new construction on major transportation corridors, widening and improvements of municipal streets, urban and rural highways, and improvements to interstate highways. Mr. Zipper has also managed and served as project geotechnical engineer on numerous bridge foundation projects throughout Washington State. These were predominantly engineered to WSDOT criteria, and encompass a wide variety of locations and site conditions. Retaining wall and slope stabilization designs provided on these projects have included MSE walls, soldier piles with and without tiebacks, soil nail walls, and gravity walls.

J.A. Brennan Associates

J.A. Brennan Associates, PLLC has provided professional landscape architecture and planning services to public and private clients in the U.S and Asia since 1988. The professionals at J.A. Brennan use integrity and imagination combined with a commitment to conservation and restoration to meet special client requirements in many different capacities. These include: recreational and regional park master planning and design, trail system planning, coastal studies and shoreline restoration, river basin studies, stream and wetland enhancement, EIS and environmental studies, development master planning, urban and streetscape design, and institutional campus master planning and design.

Jim Brennan, Landscape Architect, is principal of J.A. Brennan Associate and is responsible for a diverse range of landscape architectural design and planning projects. Jim's experience includes site selection and comprehensive planning through design development, construction documents, and construction observation. Jim is committed to providing imaginative solutions that produce the best fit between the project objectives and excellence in site planning and design. Jim has a particular interest in the planning and design of shorelines and waterfront areas for public enjoyment and understanding, without compromising conservation objectives.

Jim has previous experience on Terminal 117, having collaborated with engineers to develop alternative concept plans for restoring this contaminated uplands portion of the site along the Duwamish River in Seattle. The graphics developed conveyed design ideas to stakeholders and the public.

Harris & Smith Public Affairs

Harris & Smith Public Affairs specializes in complex public communication about potentially controversial matters. Areas of expertise include: environmental policy and remediation outreach; health care and public health; K-12 education; and communication between government and non-governmental entities. They provide strategic planning, media relations, facilitation of public processes, crisis communications, creation of written, audio and video materials and specialized event planning.

ATTACHMENT A – KEY RESUMES

T-117 CLEANUP DESIGN – STREETS AND YARDS



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Seattle, WA 98104

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rcarscadden@integral-corp.com

Reid M. Carscadden, P.E.
Principal Engineer

PROFESSIONAL PROFILE

Mr. Reid Carscadden is a professional engineer with more than 25 years of broad technical experience in support of environmental remediation, geotechnical, and civil engineering projects. Mr. Carscadden has led or served in a key role on numerous multifaceted remediation projects at industrial waterway and upland facilities, from the initial remedial investigation and feasibility study (RI/FS) phase, through final design and construction. He has a strong working knowledge of the CERCLA process and related cleanup regulations in several states across the country. Mr. Carscadden assists clients with strategic planning, coordination with stakeholder groups, and negotiations with regulatory agencies in development of cleanup action plans, permitting, and project implementation. He also provides expert services in support of environmental remediation and construction-related litigation and cost allocation assignments. In addition to his environmental expertise, Mr. Carscadden also has extensive experience in the design and construction of dams and containment structures for water supply, flood control, irrigation, and mining facilities in the U.S. and Canada.

CREDENTIALS AND PROFESSIONAL HONORS

B.S., Civil Engineering, Portland State University/Lewis and Clark College, Portland, Oregon, 1986

Professional Engineer, Washington (License No. 29002), Oregon (License No. 45868), Texas (License No. 94039)

CONTINUING EDUCATION AND TRAINING

Environmental Law Center, Advanced Sediment Conference, Seattle, WA, April 2010
(8 hours)

Environmental Law Conference on Environmental Cleanup 2010, Legal, Regulatory and Technical Issues, Portland Harbor, Remedial Investigation Report, and Source Control, Portland, OR, January 2010

Environmental Law Conference on Source Control and Contaminated Sediment, Seattle, WA, October 2009

Optimizing Decision-Making and Remediation at Complex Sediment Sites, New Orleans, LA, January 2008

Battelle International Conference on Contaminated Sediments, Savannah, GA, January 2007
Western Dredging Association, Pacific Chapter 2007 Annual Meeting, Honolulu, HI, October 2007
The 7 Hidden Reasons Employees Disengage & Leave, Advanced Management Institute, American Council of Engineering Companies Webinar, May 2007
Underwater Inspection of Waterfront Structures, American Society of Civil Engineers (ASCE) Ports & Harbors, Seattle Section Meeting, Seattle, WA, September 2007
Sediment Management Annual Review Meeting. Seattle District Corps of Engineers, Seattle, WA, May 2007
The Hylebos Natural Resource Damage Group Settlement: Innovation Leads to Restoration, Commencement Bay/Marsh Sediment Seminar Series, November 2006
Environmental Dredging Equipment, Processes, and Operations, EPA Sediment Remediation Internet Seminar, October 2006
Natural Attenuation of Contaminated Sediments, EPA, Office of Superfund Remediation and Technology Innovation, Sediment Remediation Internet Seminar, October 2006
Seminar on Jurisdictional Reach of Clean Water Act and related Supreme Court Decisions, Environmental Law Education Center Seminar Series, July 2006
Sediment Capping at Puget Sound Resources, ASCE, Seattle Chapter Presentation and Site Tour, May 2006
Western Dredging Association XXI Technical Conference, New Orleans, LA, June 2005
Advancing Risk-Based, Scientifically Sound Approaches for Evaluation of Sediment Management Decisions, October 2004
A Practitioner's Guide to Natural Resources Damages, November 2003
Brownfields 2003, Portland, OR, October 2003
Sediment Management Working Group, Fall Member Workshop, October 2003
Superfund & State Cleanup Laws Conference, May 2003
Hazardous Waste Operations and Emergency Response 8-hour Refresher Course, April 2003
ASCE Dredging and Dredge Material Disposal Conference, 2002
Dam Safety Conference, Las Vegas, NV, 2000
Landslides in the Puget Sound Region, University of Washington, 1998
Tailings and Mine Waste Conference, Colorado State University, 1998
Technical Considerations in Tailings Covers—Short Course, Colorado State University, 1998
Environmental Remediation Short Course, 1996
Dam Design, Construction & Rehabilitation in Washington State, Washington State Department of Ecology, 1994
Surface Water Design—Short Course, King County, 1994
Hazardous Waste Site Operations—8-hour Supervisor Course, 1994
Ground Modification Applications in Geotechnical and Geoenvironmental Engineering, ASCE/UOW, 1993
Soil Nailing and Reinforced Soil Walls, ASCE/UOW, 1992
American Society for Testing and Materials, Slurry Wall Symposium, 1991

Geology of Puget Sound and Landslide Hazards, ASCE/AEG/UOW, 1991
Fundamentals of Health and Safety at Hazardous Waste Sites—40-hour Training, 1990
Design Professionals and the Law, Washington State Bar Association, 1989
Design and Construction Using Geotextiles, ASCE, 1988

PROFESSIONAL AFFILIATIONS

American Society of Civil Engineers
Western Dredging Association
American Society of Dam Safety Officials

RELEVANT EXPERIENCE

Environmental Remediation—Sediments

Remedial Design for Greens Bayou Sediment Management Actions, Houston, Texas—Project manager responsible for remedial design for dredging and disposal of contaminated sediments from the Greens Bayou shipping canal near Houston, Texas. Contaminants of concern include DDT and associated degradation products, hexachlorocyclohexane, PAHs, and arsenic. The project design involves dredging of approximately 500,000 cy of sediment, including maintenance sediments from the federal navigation channel and contaminated sediment from six adjacent dredge material management units, at depths ranging from approximately 4 to 26 ft below the riverbed. The sediment will be removed using hydraulic dredging methods, and pumped up to 10,000 ft to an approximately 30-acre upland confined disposal facility. Because of bank stability constraints and existing marine structures that preclude deeper dredging, a portion of the dredged surface will be covered with a thin-layer enhancement cap. Benched excavations and/or buttressing fills will be required in some locations to provide long-term slope stabilization for the deeper dredge cuts. Project responsibilities included management of engineering site investigations and engineering analyses and design, preparation of construction plans and specifications, and assistance with project permitting and construction bidding and contractor selection, and long-term performance monitoring.

Head of the Thea Foss Waterway Remediation, Commencement Bay, Tacoma, Washington—Engineer of record responsible for management of final design and preparation of construction plans and specifications for this CERCLA remediation, located in Commencement Bay. The design included dredging of contaminated intertidal sediment, placement of a granular cap and impermeable geomembrane cap to contain nonaqueous phase liquid (NAPL), stabilization of shoreline banks, and scour protection for stormwater outfalls (including two 96 in. outfalls). Responsible for review of final construction plans and specifications, quality assurance documents, and related design documents required for EPA project approval. Also provided assistance to client with contractor selection and ongoing consultation during project implementation.

Cascade Pole Wood Treating Facility Remediation, Olympia, Washington—Engineer of record responsible for design and construction services for remediation of contaminated

sediments at the Cascade Pole wood treatment facility, located in south Puget Sound. Contaminants of concern included PAHs, pentachlorophenol (PCP), dioxins/furans, and metals in soil, groundwater, and sediments. Remediation was completed under the Washington State Model Toxics Control Act and included excavation of approximately 50,000 cy of shoreline soil, debris, and intertidal sediment, construction of a onsite disposal facility in the upland area of the Port's property (which will ultimately be used by the Port for light storage and parking), a nearshore containment structure (sheetpile cofferdam) along the shoreline, habitat improvements, and installation of groundwater/NAPL pumping wells and treatment system upgrades. Responsibilities included engineering investigations; feasibility evaluations to assess alternative remediation strategies for cleanup of the upland area soil, groundwater, and offshore sediments; preparation of final design plans, specifications, and permit documents; and management of the remedial construction contract and onsite quality assurance program for the sediments operable unit. Design development involved negotiations with the Washington State Department of Ecology (Ecology) and coordination with governing regulatory agencies to satisfy substantive requirements of applicable project permits. The presence of Chinook salmon at the site, protected under the Endangered Species Act, required formal consultation with the National Marine Fisheries Service. Design and construction of the upland disposal facility provided for beneficial reuse of the contaminated excavation spoils, while also providing considerable cost savings over alternative disposal options.

Lower Duwamish Waterway Remedial Investigation and Feasibility Study, Seattle, Washington—Serve as lead technical representative for one of four PRPs for the Lower Duwamish Waterway Superfund site. Responsibilities include technical review and contributions to the full range of RI/FS documents, and active participation in PRP and agency group meetings and negotiations.

West Bay Berth Deepening and Remediation Project, Port of Olympia, Washington—Project manager responsible for developing engineering and remediation plans for deepening of the Port of Olympia shipping berths located in south Puget Sound. The deepening is proposed to accommodate larger vessels for a prospective Port tenant. Sampling of the dredge prism revealed that the sediments contain dioxin at levels that preclude open-water disposal; NAPL is also present. Recent sampling by Ecology has revealed further widespread dioxin contamination throughout the surrounding bay (Budd Inlet), which has prompted a bay-wide RI/FS. Compounding these environmental obstacles, geotechnical analyses indicate that the planned dredging poses a risk to the stability of adjacent slopes and bulkhead structures beneath the Port's pier. To address these constraints, a range of alternative design strategies was developed, integrating slope stabilization measures, *in situ* containment of contaminated under-pier slope material and subsurface NAPL, with a benched dredging scheme to minimize the volume of contaminated dredge material requiring costly off-site disposal. A conceptual design report and cleanup plan, including feasibility cost analysis, has been submitted to Ecology. Design development involved coordination and negotiations with Ecology to gain acceptance of the proposed strategy, addressing concerns relating to the nature and extent of contamination, source control,

potential contaminant releases during dredging, and future cleanup plans for the surrounding bay. Also assisted the Port in developing preliminary project permit documents.

Terminal 117 Non-Time Critical Removal Action, Lower Duwamish Waterway, Seattle, Washington—Project manager responsible for development of a cleanup plan to address contaminated sediments and adjacent upland soil and groundwater at the T-117 early action site, located within the Lower Duwamish Waterway Superfund site. The T-117 site was historically used for asphalt products manufacturing. Various other chemicals and oil products were processed at adjacent upland properties, which have also been identified as potential source areas. As a result of these historical operations, the surrounding City streets and residential lots have also been impacted. Primary constituents of concern are PCBs, PAHs, total petroleum hydrocarbons, and arsenic. Project involves coordination with a team of several consulting firms representing the potentially responsible parties, EPA, Ecology, and other stakeholders. The project team is currently conducting a joint engineering evaluation and cost analysis (EE/CA), or streamlined RI/FS, under CERCLA's Non-Time Critical Removal Action program. Remedial alternatives under consideration include excavation, dredging, off-site disposal, treatment, *in situ* containment (capping), and monitored natural recovery. The team is also working closely with property owners to develop a cleanup strategy that will not preclude future anticipated use of the site in this mixed industrial/residential project setting.

Remediation of Mercury-Contaminated Sediment, Confidential Location—Co-managed feasibility evaluation to assess remedial options to address mercury-contaminated sediments at an offshore drilling platform. Project involved a comprehensive compilation and review of the state-of-the-practice for remediation of mercury-contaminated sediments in deep-water settings around the world. More than 70 sites were reviewed. The client used the report for planning and long-term management of drill cuttings.

Engineering Evaluation/Cost Analysis for a Former DDT Manufacturing Facility, Portland, Oregon—Lead engineer for EE/CA work plan for early action cleanup of contaminated sediments within the Portland Harbor Superfund site on the Willamette River. Assisted in preparation of engineering components of the EE/CA work plan and associated site characterization planning documents.

Former Glenbrook Nickel Facility Sediment Remediation, Coos Bay, Oregon—Senior technical reviewer for remedial investigation and cleanup activities at the former Glenbrook Nickel facility. The scope of work involved sediment sampling to determine the extent of elevated nickel in intertidal and subtidal sediments in the vicinity of the docks where nickel ore was transferred to the upland processing facility. A feasibility study was conducted to assess alternative methods for sediment excavation and processing. The selected remedy involved a combination of excavation, capping, and natural recovery. Innovative construction techniques were developed to allow much of the work to be completed “in the dry,” resulting in greater precision of the dredge cuts and thus reduced dewatering and disposal costs.

Todd Shipyards Remediation, Harbor Island, Seattle, Washington—Lead project engineer for feasibility-level engineering evaluations and design of proposed remedial actions, including dredging of approximately 150,000 cy of contaminated sediments, construction of the nearshore confined disposal facility, sediment capping, and associated material handling/segregation and disposal activities.

Slip 4 Engineering Evaluation and Cost Analysis, Lower Duwamish Waterway, Seattle, Washington—Project manager and senior technical reviewer for feasibility analyses and design, respectively, for cleanup of PCB-contaminated sediments at the Slip 4 early action site, located within Lower Duwamish Waterway CERCLA Superfund site. Responsibilities included negotiations with EPA in development and evaluation of EE/CA scope of work and implementation plans, engineering site investigations, remedial alternatives, construction cost estimates, comparative analyses, and project reports. Alternatives included sediment dredging, disposal, capping, integrated shoreline stabilization/erosion protection/habitat restoration measures, and cleaning of stormwater outfalls. Served as senior reviewer for design phase of project. Project implementation is currently scheduled to begin in 2011.

West Branch Grand Calumet River, Restoration Alternatives Analysis (Feasibility Study), Hammond County, Indiana—Engineering task manager responsible for development of restoration alternatives and feasibility level design for remediation of approximately 6-mile-long reach of one of the most contaminated industrial waterways in the United States. The project involved human health and ecological risk assessments, and development of remedial action objectives and risk-based cleanup levels. Remedial technologies considered included dredging, upland disposal and treatment of sediments and water, capping, natural recovery/enhanced natural recover, and phytoremediation. Responsibilities also included assistance to the council in selection of preferred restoration alternative and associated presentations to citizen groups, regulatory agencies, and other stakeholders. Provided consultation during construction phase on alternative sediment capping methods and materials.

Port of Port Arthur Master Development Plan, Texas. Lead civil engineer for preparation of master development plan for major updates to a seaport facility.

Utica Terminal Harbor, and Barge Canal Sediment Investigation, Utica, New York—Senior reviewer responsible for technical and quality review of remedial investigation report. The site sediments were impacted by historical operations of a manufactured gas plant. Review responsibilities focused on sediment core sampling and analytical results, bathymetric survey data, geotechnical characterization, and contaminant mobility test results.

Port of Tacoma Graving Dock Filling Project, Tacoma, Washington—Project engineer responsible for design of stormwater runoff controls and preparation of an NPDES stormwater management plan for disposal of 250,000 cy of dredge spoils into an upland containment facility constructed on the site.

Environmental Remediation—Upland

Northwest Transformer Superfund Site, Bellingham, Washington—Lead project engineer and resident engineer of record responsible for preparation of final design and construction contract documents for remediation of PCB-contaminated soil and groundwater at a former transformer recycling facility. Design included structurally supported deep excavations to remove contaminated soil, light NAPL (LNAPL) recovery, offsite soil disposal and incineration, construction of a soil cover system to contain residual contamination, and demolition and disposal of onsite structures and debris. An onsite testing program was employed during construction to facilitate real-time screening of PCB contaminant levels for delineation and disposal of high and low-level contaminated soil. Managed construction contract, onsite construction quality assurance (CQA) and laboratory testing programs, and coordination with federal, state, and local regulatory agencies throughout the work. Prepared construction records report for final closure.

Queen City Farms Superfund Remediation, King County, Washington—Project engineer responsible for feasibility study of groundwater cutoff and soil excavation alternatives, and installation of a LNAPL recovery system. Project involvement included preliminary design of a 2,300-ft-long soil-bentonite slurry wall, supervision of geotechnical explorations, feasibility cost analyses, development and implementation of laboratory tests to assess chemical compatibility of slurry wall construction materials, and preparation of a feasibility study report.

South Park Remediation Project, Seattle, Washington—Project manager for remedial investigation and design for cleanup of PCB-contaminated soil at a mixed use residential/industrial site encompassing several city blocks located in south Seattle.

Kaiser Aluminum Wet Scrubber Sludge Cleanup, Tacoma, Washington—Project engineer responsible for remedial design and CQA for PAH-contaminated wet scrubber sludge, including design of a reinforced low density fill and storm sewer system, all constructed over soft sludge.

Hamilton Street Remediation, Spokane, Washington—Engineering task manager responsible for preparation of preliminary designs and associated engineering design reports and remedial construction permit documents. Site contaminants at this former manufactured gas and coal tar processing facility located adjacent to the Spokane River included volatile and semivolatile organic compounds and PAHs (including NAPL) in both soil and groundwater. The remedial design included a soil cover system, stormwater runoff controls, streambank stabilization and bioengineering, groundwater monitoring, and institutional controls.

Western Processing Federal Superfund Site, Kent, Washington—Project engineer responsible for evaluation of RCRA cover options for containment of contaminated soil and groundwater, and engineering support for an *in situ* bioremediation pilot study.

Boeing Portland Superfund Site, Portland, Oregon—Project engineer responsible for analysis of contaminant transport parameters used for groundwater modeling, and feasibility cost analysis of groundwater treatment options.

Colbert Landfill Superfund Site, Spokane, Washington—Project engineer responsible for investigation of soil and landfill gas conditions, and preliminary design of a landfill gas extraction and treatment system and preparation of a landfill closure plan.

Habitat Restoration/Geotechnical/Civil

USDA Forest Service, Architecture and Engineering Indefinite Delivery/Indefinite Quantity (ID/IQ) Contract, Southeast Alaska—Program manager responsible for technical coordination, management and senior review for multiple engineering and habitat restoration projects in the Tongass and Chugach national forests.

Fish Passage Design Project, Central Prince of Wales Island, Alaska, USDA Forest Service—Project manager for design of stream restoration projects at five road crossing sites throughout Central Prince of Wales Island. The sites were identified as obstructions to valuable upstream habitat. Site characterization and design activities were carried out in accordance with the U.S. Forest Service's "Stream Simulation" design guidance, which involved comprehensive geomorphic, hydrologic, and fisheries characterization to facilitate selection and design of appropriate bedforms to enhance the fish passage characteristics of the stream.

Alaganik Boat Ramp Replacement Project, Chugach National Forest, USDA Forest Service, Alaska—Assistant project manager/senior technical reviewer for design of replacement boat ramp on the Copper River in southeast Alaska. Project involved geotechnical and topographic site characterization, hydrodynamic modeling, preparation of alternative boat ramp and access concepts, and preparation of design drawings, specifications, and engineer's construction cost estimate.

Cedar Moraine Safety Studies, Cedar Falls, Washington—Co-project manager for large-scale geotechnical study to assess the potential impacts associated with seepage from the Chester Morse/Masonry Pool Reservoir System, one of the two primary reservoir systems supplying water to the City of Seattle. The study was initiated due to ongoing concerns about potential instability of the moraine slopes adjacent to the reservoir. (In the early years of the reservoir operation, the Moraine slopes failed, releasing some 3,000,000 cy of soil in a debris flow slide, with groundwater seepage rates reaching 20,000 cfs. The debris flow destroyed a small logging community just east of North Bend.) The safety study included a compilation and analysis of more than 70 years of geologic, hydrogeologic, and hydrologic site data from the site; development of a hydrogeologic model, geotechnical investigations, and development of slope stabilization and early warning measures.

Chester Morse Emergency Pumping Project, Cedar Falls, Washington—Project manager for design and construction of an emergency pumping scheme and associated channel deepening and dike system between the Chester Morse Reservoir and the Masonry Pool Reservoir. This project was carried out on an emergency, fast track schedule (3-month

design/build), in response to low reservoir levels that threatened the City of Seattle's drinking water supply. The project was closely scrutinized by city, state, and federal agencies due to water quality, fisheries, tribal, archeological concerns, and project costs. The project required close coordination with a multi-agency team of more than 30 members operating under consensus-style management framework established to respond to the emergency situation. The project involved design and construction of an approximately 1,000-ft-long dike and integrated pumping structure, with a capacity of approximately 200 million gallons per day. Due to fluctuating lake levels, much of the construction needed to be completed below the water surface.

Fuel Tank Preliminary Foundation Design, Port Angeles, Washington—Conducted geotechnical study of foundation alternatives for a 2.3 million gallon fuel tank. Study included geotechnical investigations, evaluation of liquefaction potential and subgrade improvement options, and design of shallow and deep foundation alternatives.

Daishowa Paper Mill Expansion Project, Port Angeles, Washington—Supervised geotechnical investigations, and prepared preliminary foundation designs for support of paper manufacturing equipment. Conducted liquefaction analyses and evaluated foundation improvement alternatives, including vibro-replacement, stone columns, seismic dikes, and preloading.

Methow Valley Irrigation System, Twisp, Washington—Project engineer responsible for investigation of a 40-mile-long irrigation canal system and evaluation of canal structures, including embankments, channels, control gates, and flumes. Assisted in water balance analysis and assessment of system losses and efficiency.

Hannegan Road Dam, Bellingham, Washington—Prepared designs and permit and construction contract documents and was responsible for the construction management (CM)/CQA program for the Hannegan Road stormwater detention dam. The project involved construction of a new zoned earth dam, including a 48-in.-diameter, low-level outlet structure designed to allow fish passage, and a gabion spillway structure.

Cranberry Lake Dam, Anacortes, Washington—Project engineer responsible for preparation of designs, permits, and construction contract documents, and management of CM/CQA program for the Cranberry Lake Flood Control Dam. The project involved rehabilitation of an existing dam, including installation of downstream chimney and blanket drains, an emergency spillway, and raising and armoring of the dam crest.

Wenatchee Heights Reservoir No. 2, Wenatchee, Washington—Project manager and engineer responsible for design, construction documents, permitting, and CM/CQA for an 80-acre-ft water storage dam upgrade project. The project involved raising an existing dam, constructing chimney and blanket drains to collect seepage, and installing a new low-level outlet pipe and service spillway structure.

Great Depression Dam, Wenatchee, Washington—Project engineer responsible for site characterization, design, construction drawings, permit and construction contract documents, and bid solicitation for an irrigation storage reservoir and dam.

Zimmerman Pond Dam, Wenatchee, Washington—Project engineer responsible for site characterization, design, construction drawings, permit and construction contract documents, and bid solicitation for an irrigation storage reservoir and dam.

Willow Creek Reservoir Study, Hepner, Oregon—Hydrologic technician responsible for collecting and analyzing water quality samples for limnological study of Willow Creek Reservoir. Assisted with data analysis and preparation of report assessing probable causes and impacts of eutrophic reservoir conditions.

Mining

Northshore Mine Tailings Facility, Silver Bay, Minnesota—Task manager responsible for design of three large dams, totaling more than 2 miles in length and up to 200 ft in height. The designs involved converting from downstream and centerline construction to upstream construction methods, and construction over soft clay and peat foundations. Responsibilities included design planning, geotechnical and hydrologic analyses, preparation of construction drawings, and supervision of construction quality assurance activities.

Lac des Iles Mine Tailings and Water Storage Dams, Thunder Bay, Ontario, Canada—Task manager responsible for planning, design, and construction of tailings facilities. Designs included zoned earthfill, rockfill, and HDPE-lined dams, concrete and blasted bedrock spillway structures, and management of construction contract and quality assurance programs. Project design included six individual dams, with a wide variety foundation conditions including peat and soft tailings. Managed multi-year, multi-million dollar construction contract and construction quality assurance activities. Project schedule constraints required 24/7 construction during extreme winter conditions.

Van Stone Mine Tailings Facility, Colville, Washington—Project engineer responsible for geotechnical investigations and analyses, including electric piezocone testing, stability analyses, and preliminary design for expansion of the tailings impoundment.

Beal Mountain Mine Heap Leach Facility, Butte, Montana—Project engineer responsible for evaluation of heap leach pad and containment dike design options, development of final construction staging and water balance management plans, and construction monitoring.

Golden Reward Mine Heap Leach Facility, Lead, South Dakota—Project engineer responsible for evaluation of heap leach pad design options and preparation of final designs for an asphalt lined leach pad, leak detection and recovery system, and process facility foundations.

Basin Creek Mine Heap Leach Facility, Helena, Montana—Resident engineer responsible for conducting geotechnical site investigations and analyses, and construction monitoring for a heap leach pad liner system and containment dike.

Coeur Rochester Mine Heap Leach Facility, Lovelock, Nevada—Project engineer responsible for managing geotechnical investigations.

Cinola Gold Mine Development, Queen Charlotte Islands, British Columbia, Canada—Project engineer responsible for tailings and waste rock site selection studies, baseline environmental field investigations, and development of pilot study program to assess alternative methods to control acid mine drainage.

Golden Bear Mine Project, British Columbia, Canada—Project engineer responsible for hydrologic, water quality, and fisheries investigations to support evaluation of potential impacts of disposing of mine tailings into a natural lake.

Ominica Access Road, Prince George, British Columbia, Canada—Served as resident engineer for construction of an 80-km mine access road. Provided construction recommendations for road alignment, slope stability, erosion and drainage control, temporary river crossings, and coordination with environmental regulatory agencies.

PUBLICATIONS AND PRESENTATIONS

Carscadden, R. 2007. Source identification, control and remediation strategies. Session chair and speaker, Battelle International Conference on Contaminated Sediments, Savannah, GA.

Carscadden, R., and J. Lally. 2007. Barge dewatering on contaminated sediment dredging project, Discussion on the state-of-the-practice. Presentation to Western Dredging Association, 2007 Annual Meeting, Honolulu, HI.

Carscadden, R.M. 2002. Cascade Pole sediments remediation project—design and construction. Proceedings of Dredging and Dredged Material Disposal 2002, ASCE.

Scott, J.L., R.M. Carscadden, J. Lally, and R. Webb. 2002. The overdredge allowance for environmental dredging. Proceedings of Dredging and Dredged Material Disposal 2002, ASCE.



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Eric L. Pilcher, P.E.
Senior Engineer

PROFESSIONAL PROFILE

Eric Pilcher is a professional civil engineer specializing in land planning, brownfield redevelopment and stormwater management. He has 14 years of experience in preparing designs for site and infrastructure improvements on projects ranging in size from 1-acre outparcels to 100-acre campuses. Design elements include demolition, roadway alignment, access and site layout, earthwork and fine grading, storm and sanitary sewers, water distribution, erosion and sediment control best management practices (BMPs), and storm water conveyance, quality treatment, and flow control.

In addition to design, Mr. Pilcher has substantial experience in project management and construction contract administration. Management duties include permit coordination, preparation of construction specifications, cost estimating, review of bids, review of submittals, response to requests for information, field observations, and generation of punch lists.

CREDENTIALS AND PROFESSIONAL HONORS

B.CE, Civil Engineering, Georgia Institute of Technology, Atlanta, Georgia, 1995

Registered Professional Engineer, Georgia (License No. 26727), Washington (License No. 43952)

CONTINUING EDUCATION AND TRAINING

Hazardous Waste Operations and Emergency Response 40-hour Certification (2009) and refresher (2010)

CPR/First Aid Certification (2010)

PROFESSIONAL AFFILIATIONS

Member of American Society of Civil Engineers

RELEVANT EXPERIENCE

CERCLA/Brownfield Redevelopment

Point Ruston, Tacoma, Washington—Led design efforts and directed consultants to prepare construction documents for a \$14 million local improvement district (LID) within the

ASARCO/Tacoma Superfund site. The design included 1 mile of new roadway improvements meeting Tacoma's "Complete Streets" standards, two roundabout intersections, replacement of a sanitary trunk line, a new storm sewer system with appropriate treatment measures, and demolition/abandonment of existing improvements. The design incorporated remedial action elements as prescribed by the EPA, including an impermeable cap meeting requirements of the Resource Conservation and Recovery Act.

In conjunction with the above LID project, prepared plans for mass grading the proposed 80-acre mixed-use development. Construction documents included design of erosion and sediment control BMPs to be implemented during earthwork operations. The *in situ* soils contained elevated levels of contaminants; therefore, emphasis was given to sediment transport and dust control. Prescribed BMPs included construction housekeeping practices such as wheel washes and water sprays, and sediment controls such as diversion berms and ponds. Temporary stabilization measures included the use of an acrylic copolymer, similar to an anionic polyacrylamide.

The project required coordination with EPA's contractor regarding the placement location and contaminant concentrations of soils generated from the Ruston/North Tacoma residential yard cleanup. In addition, laboratory reports for air monitoring and leachate and runoff sampling were reviewed on a routine basis for inclusion in monthly reports. Additional documentation included site-specific project specifications for use in construction management plans, a sequence of development plans, and an operations, maintenance, and monitoring plan.

Slip 4 Early Action Area, Seattle, Washington—Reviewed, edited, and provided feedback on bid package documents, such as construction plans and specifications, for an \$8 million sediment removal and capping action within Slip 4 of the Lower Duwamish Waterway. The project includes bank excavation and dock removal, as well as in-water dredging and capping. Construction is scheduled to occur between September 2011 and March 2012.

Stormwater/Erosion and Sediment Control Management

Freshman Residence Halls, Emory University, Georgia—Designed and performed construction contract administration for two five-story residence halls supporting 195 beds. The project required realignment of 500 linear feet of roadway and reconfiguration of an intersection. Given that the project is located within an active college campus, the design and construction activities had to be coordinated to prevent interruptions of access and utility service. Stormwater treatment is provided within a bio-retention pond and volume management is provided in chambers beneath an adjacent athletic field. Provisions were included to recapture storm water for grey water reuse within the buildings, assisting the project in achieving LEED Gold certification.

Stone Mountain Middle School, Stone Mountain, Georgia—Managed design and performed construction contract administration for site improvements at a new 164,000 square foot school campus. The site features include separate traffic flows for buses, parents, faculty and service vehicles, two multipurpose athletic fields, tennis courts, buffer enhancements

adjacent to residential properties, and stormwater management in three extended detention ponds. Site access required additional permitting and coordination through the Georgia Department of Transportation (DOT), including a new traffic signal at an adjacent intersection.

Alpharetta High School, Alpharetta, Georgia—Provided construction contract administration for a new 73-acre hilltop campus featuring a 343,000 square foot academic building and four athletic fields. Stormwater quality treatment is provided through a series of parking lot rain gardens and extended detention ponds. The overall scope of the project and the site's hilltop terrain required a phased approach to erosion and sediment control with particular emphasis on slope stabilization. Vegetative BMPs included maintenance of buffer zone, topsoil management, mulching, temporary and permanent seeding, and matting blankets. In addition to typical construction BMPs such as construction exits, sediment barriers, traps and ponds, and outlet protection, structural practices included check dams, diversion berms, temporary downdrains, gabion/MSE walls, and reinforced swales.

Inner Harbour Hospital, Douglasville, Georgia—Designed site improvements and performed construction contract administration for a new dormitory and classroom building at a children's psychiatric hospital. In addition to site grading, water and sanitary sewer service, the project required design of a private roadway with strong emphasis on American's with Disability Act accessibility standards. Stormwater treatment and flow control is provided within a bio-retention pond. Erosion control BMPs included the use of diversion swales and check dams to divert construction runoff away from a downstream lake.

DeKalb Medical Center at Hillandale, Lithonia, Georgia—Designed site improvements and performed construction contract administration for a new five-story, 100-bed hospital. Improvements included road widening and driveway improvements along an adjacent county right-of-way, water distribution, fire protection and sanitary sewer service, and a storm drainage network to collect runoff from the facilities new parking lot. To comply with on-site and adjacent properties constraints, a wet pond was designed and constructed for storm water management purposes.

DeKalb Medical Center Women's Pavilion, Decatur, Georgia—Designed site improvements and performed construction contract administration for a new five-story, 144-bed women's pavilion over a three-level parking deck. Traffic impacts generated by the development required roadway improvements along two adjacent streets. Rerouting of existing utilities was required to accommodate the footprint of the parking deck. Special attention was given to construction sequencing to ensure that there would be no interruption of service to other hospital buildings. To achieve adequate volume and preserve an existing stand of mature trees, stormwater treatment and detention are provided within underground vaults.

Lost Mountain Self Storage, Powder Springs, Georgia—Designed site improvements and provided field observations for a multi-story climate controlled self-storage facility, retail

building, and office condominiums. Access to the property required piping of 290 linear feet of stream and associated mitigation through the U.S. Army Corp of Engineers. In addition to design of standard erosion and sedimentation control BMPs, pre- and post-construction bathymetry was obtained at a downstream lake, and analyzed to determine if significant sediment transport occurred during construction activities.

Master Planning

Port Blakely, Bremerton, Washington—Prepared a feasibility study for an 800-acre master-planned community development, featuring an estimated 2,000 residential units with supporting commercial and municipal uses. The study included *pro forma* cost analysis, capital recovery, and anticipated profit over a projected 10-year build-out. Specific emphasis was given to infrastructure improvements required to accommodate the project, including roadway access, municipal water storage and distribution, and storm and sanitary sewerage.

Engineering/Land Development Design

University of Georgia Sanford Stadium Expansion, Athens, Georgia—Provided design upgrades and reroutes for existing utilities and performed construction contract administration to accommodate a \$25 million dollar stadium expansion. The upgraded improvements allowed for 5,000 additional seats to the north deck, 27 suites, and a new concession concourse.

The New Schools of Carver, Atlanta, Georgia—Designed and performed construction contract administration for a 55-acre high school campus containing five separate buildings and three athletic fields. The design allowed for preservation of historic structures while providing improved access and circulation throughout the campus. The natural drainage patterns from the site required design of four separate storm water management ponds. Access improvement to the site were coordinated and permitted through Georgia DOT.

Lenox Marketplace, Atlanta, Georgia—Prepared design drawings and performed construction contract administration for an urban in-fill retail shopping center encompassing a full city block within Atlanta's Buckhead community. The project required coordination of access drives and streetscapes through both the City of Atlanta and Georgia DOT. The centralized parking deck has multiple access points at its various levels. As the truck dock is located in the lowest level, considerable planning was necessary to ensure that truck routes would not conflict with support columns. Stormwater flow control is provided in underground storage pipes beneath the parking structure.

Wachovia Bank, Various Locations—Designed site improvements and performed construction contract administration for various Wachovia and SouthTrust branch banks in Georgia and Tennessee. Each location required design of site layout, access, domestic water service, fire protection coverage, sanitary sewer service, storm water collection and conveyance, and erosion and sediment control BMPs. Additional designs for storm water quality treatment

and flow control were required in instances where regional facilities were not provided within a greater development.

Newnan Pavilion, Newnan, Georgia—Designed and prepared construction documents for a 459,500 square foot retail shopping center anchored by business such as Home Depot, Kohl's, PetSmart, and Office Max. Project scope included site layout and parking lot design, grading design and earthwork analysis, sanitary sewer and domestic water service, fire protection coverage, stormwater collection, conveyance, treatment and flow control, and phased design of erosion control BMPs for clearing and grubbing, mass grading, and stabilization activities.

Southlake Pavilion, Morrow, Georgia—Designed and prepared construction documents for a retail shopping center anchored by business such as AMC Theatres, LA Fitness, Barnes & Noble, Old Navy, and Staples. Project scope included site layout and parking lot design, grading design and earthwork analysis, sanitary sewer and domestic water service, fire protection coverage, stormwater collection, conveyance, treatment and flow control, phased design of erosion control BMPs for clearing and grubbing, mass grading, and stabilization activities, and stream and wetland mitigation.

Elm Street Townhomes, Atlanta, Georgia—Designed and prepared construction documents for 36 townhome units in Atlanta's English Avenue neighborhood. The site, located on three separate city blocks, is bifurcated by a combined sewer trunk line. Project scope included design of alleyways, hardscape, water and sanitary sewer service, stormwater collection, conveyance and flow control, and erosion and sediment control BMPs. Given site constraints, stormwater flow control is provided in multiple underground storage pipes. Both the storage pipes and building foundation systems were designed such that angles of repose would not place structural influence upon the aging combined sewer trunk line.

Alexan Buckhead, Atlanta, Georgia—Designed site improvements and performed construction contract administration for a mix-used condominium building in Atlanta's Buckhead community. The project, which has roadway frontages on three sides, required design of multiple vehicular access points as well as pedestrian hardscape. Additional scope included design of water and sanitary sewer service, stormwater collection, conveyance and flow control, and erosion and sediment control BMPs for various construction phases. Stormwater flow control is provided in underground storage pipes beneath the parking structure.

Krog Street Lofts & Townhomes, Atlanta, Georgia—Designed site improvements and performed construction contract administration for a 6-building loft and townhome in-fill development in Atlanta's Inman Park neighborhood. The project scope included design of grading, driveways, water and sanitary sewer services, fire protection coverage, stormwater collection, conveyance and flow control, and erosion and sediment control BMPs.

Resort Condominiums, Various Locations—Designed and prepared construction documents for new resort condominiums in Clarkesville, Georgia; Branson, Missouri; and Canyon

Lake, Texas. Typical design scope included site grading, water and sanitary sewer service, fire protection coverage, stormwater collection, conveyance, treatment and flow control, and erosion and sediment control BMPs for various construction phases.

Floodplain Analysis

Morris Brandon Elementary School, Atlanta, Georgia—Designed and performed construction contract administration for a new classroom and parking lot addition in Atlanta's Buckhead community. The project scope included coordination with an adjacent neighborhood homeowner's association for mutually beneficial intersection improvements, and a HEC-RAS analysis of a downstream creek to ensure that impacts from the site improvements would not raise the 100-year flood elevation.

Dallas Highway Self Storage, Marietta, Georgia—Designed site improvements and provided field observations for a multi-story climate controlled self-storage facility. Development of the site required disturbance within and alteration to an adjacent 100-year floodplain. A HEC-2 analysis was prepared to determine impacts to the floodplain and floodway from both the proposed development and adjacent culvert improvements provided by Georgia DOT. The changes were accepted by Federal Emergency Management Agency through its Letter of Map Revision process.

Sanitary/Combined Sewer Studies

Atlanta Metropolitan College, Atlanta, Georgia—Prepared a sanitary sewer study to document the conditions of an existing campus sanitary sewer network, analyze flow, and recommend and prioritize repairs and upgrades. The study took into consideration such factors as historical water usage, condition of existing pipes, hydraulic capacity, and anticipated inflow and infiltration.

The Glenn Building, Atlanta, Georgia—Prepared a combined sewer study and analysis to accommodate a historic building's change in use from office to hotel and restaurant. Existing city combined sewer was evaluated for both dry weather base flow and peak stormwater events. The study scope encompassed the point of connection to the confluence at the downstream trunk line, as well as upstream analysis for changes to the hydraulic grade. A stormwater detention vault was designed as part of the building renovation in order to reduce wet weather flows rates to levels that would accommodate the net increase in sanitary base flow.

Wastewater Treatment

Apple Mountain Resort, Clarkesville, Georgia—Project engineer for an onsite wastewater treatment plant serving resort condominiums at a golf course. The initial project scope included design and permitting of septic tanks, a lift station, 1 mile of force main, dosing tank, and septic leach fields. The greater project scope included a duplexed wastewater treatment train featuring flow equalization tank, coarse and fine screening, hopper clarifier/aerator, media filtration and ultraviolet disinfection. Treated effluent is discharged to a retention pond where it may be pumped to supplement irrigation on the golf course.

Camp Darom, Clayton, Georgia—Project engineer for an onsite wastewater treatment plant serving a dining hall, dormitories, and other associated uses at a church youth camp. The initial project scope included a septic tank, dosing tank and septic leach fields. The greater project scope was expanded to include a treatment train featuring fixed activated sludge treatment and drip dispersal network within a restricted access area.



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Randi Wexler

Senior Managing Scientist

PROFESSIONAL PROFILE

Ms. Randi Wexler has more than 25 years of experience as a regulatory specialist, with strong proficiency in regulatory affairs, environmental management system development, litigation support, compliance auditing, property transactions, and permitting. In addition, she develops strategies, implements plans, and negotiates with agencies.

Ms. Wexler has extensive experience with port and industrial projects, and she is responsible for analyzing and interpreting regulations, and for conducting inspections for compliance with RCRA, SARA, TSCA, FIFRA, CAA, and CWA. For clients in many states, Ms. Wexler acts as client manager, inspecting tenant operations for regulatory compliance and interfacing with local, state, and federal agencies during the inspection and permitting process.

In addition, Ms. Wexler develops plans to implement best management practices, helping clients to achieve and maintain substantial compliance with applicable regulations. She has worked closely with companies to develop successful environmental management systems suitable to a company's individual corporate culture.

She has performed Phase I environmental assessments at numerous industrial and waterfront sites, including marine cargo terminals, airports and airside support facilities, biomedical facilities, demolition activities, paper manufacturers, sawmills, circuit-board manufacturers, timber reload facilities, chrome-plating facilities, warehouses, and offices. She also prepares training materials and emergency response plans.

CREDENTIALS AND PROFESSIONAL HONORS

M.S., Environmental Science, Washington State University, Pullman, Washington, 1984
B.S., Environmental Studies/Biology, St. Lawrence University, Canton, New York, 1981

CONTINUING EDUCATION AND TRAINING

Hazardous Waste in California Workshop
Hazardous Materials Transportation Certification Workshop
Hazardous Waste Operations and Emergency Response 40-hour Certification and yearly refresher
ISO 14000 Lead Auditor Training

First Aid and CPR certified

“Use of Sediment Quality Guidelines in the Assessment and Management of Contaminated Sediments,” SETAC Short Course

RELEVANT EXPERIENCE

Environmental Management Systems/Compliance Auditing/Regulatory Support

Environmental Management System Development, Maryland Motor Vehicle Administration—Serve as technical lead for a gap analysis of a multifacility (44 locations), statewide agency responsible for administering driving licenses and tests, facility maintenance, and air emission and safety inspections of vehicles. Tasks include developing briefing and technical training packages for senior management and the environmental core team, providing training and advisory services to the environmental management system lead, conducting environmental compliance evaluations, and developing an applicable regulations analysis.

Environmental Management System Development, Public Port Authority, Northeastern United States—Served as the technical expert to a public port authority for development of an environmental management system for six public marine terminals, seven private marine terminals, and several dredged material containment facilities. Tasks have included strategy development, site visits, interviews, regulatory analyses, and preparation of environmental checklists and surveys to bring all facilities into substantial compliance with applicable environmental regulations.

CERCLA Allocation Assistance, Confidential Client, Chemical Distributor, Southern California—At the direction of outside legal counsel, evaluated client’s use of a former drum reconditioning facility by reviewing corporate records and interviewing employees. Other tasks have included providing technical information to a Joint Defense Group, preparing technical critiques of EPA’s proposed remedial actions, and chairing a technical committee of the Joint Defense Group in response to a unilateral administrative order issued by EPA under CERCLA.

Litigation Support/Environmental Management System, Confidential Client, Allergen and Antigen Source Materials Facilities, Spokane, Washington—Under the direction of outside legal counsel, conducted a multimedia compliance audit of four facilities. Worked closely with legal counsel and company management to develop a fast-tracked approach to bring the facilities into substantial compliance with applicable local, state, and federal environmental laws and regulations. Significant issues included proper waste designation, waste management, reporting, and employee training. Following the audit, served as environmental manager for the company during development of their environmental management system and program. Responsibilities included developing a multimedia environmental filing system; identifying all waste streams generated and instituting proper management; developing written environmental procedures for all wastes generated; preparing all environmental documentation; developing and providing employee training

on a variety of environmental topics; and preparing a company-wide contingency plan and environmental notebook.

Environmental Auditing under EPA Disclosure Agreement, Maryland Port Administration and Maryland Motor Vehicle Administration—Under an agreement with EPA, both the Maryland Port Administration and the Motor Vehicle Administration have agreed to conduct multimedia environmental audits of all of their facilities. Act as the lead auditor for 55 sites across Maryland auditing facilities for compliance with RCRA (subparts C and I), TSCA (asbestos and PCBs), FIFRA, EPCRA, CWA (stormwater, process water and management of oil), CAA, and SDWA (underground injection control). Tasks include site visits, employee interviews, and preparation of disclosure reports.

Internal Environmental Auditing, Confidential Client, Former Rocket Fuel Manufacturing Facility, Northern California—As part of an audit team, was responsible for conducting a multimedia environmental audit of three RCRA Part B storage facilities. The storage facilities are currently used to store demolition wastes as well as manufacturing wastes. The audit included development of an audit checklist, a tour of each facility, interviews with operators, and a review of internal manifesting documents, training program documentation, as well as contingency and emergency response plans.

Temperature Regulation Development, Littleton-Englewood Waste Water Treatment Plant, Colorado—As part of the Colorado Water Quality Control Commission triennial review process for Regulation #38 South Platte River, led a team that conducted a reasonable potential analysis for compliance with new temperature regulations. Additional tasks included analyzing a large in-stream data set of upstream and downstream water temperatures to determine compliance with the new temperature regulation, developing expert testimony for presentation to the commission, and proposing modifications to the new regulation. The wastewater treatment plant received a temporary modification and changes were made to the regulation based on analyses conducted.

Water Quality Permitting, Ship Repair Facilities, San Diego Bay, California—Assisted two ship repair facilities with evaluating tentative orders for NPDES permits and waste discharge requirements issued by the Regional Water Quality Control Board (RWQCB) Region 9 San Diego. Tasks included a detailed analysis of surface water data collected by the ship repair yards and methodologies used by RWQCB to develop average monthly effluent limitations and maximum daily effluent limitations for copper, mercury, zinc, cadmium, and nickel. A request for intake water credits along with additional sampling was presented to RWQCB to allow the facilities to achieve compliance.

Green Permit Preparation, Confidential Client, Semiconductor Manufacturer, Gresham, Oregon—Under the direction of outside legal counsel, conducted a full-scale RCRA generator compliance audit. Significant issues included use of hazardous waste tanks, RCRA air emission issues, waste designations, and employee training. Worked closely with the facility environmental manager and staff to develop and implement an action plan to address issues of non-compliance. Worked with the client to obtain a Green Permit.

Compliance Assessment, Confidential Client, Grinding Fluids Manufacturer, Gresham, Oregon—In support of a business investment, conducted a multimedia environmental compliance audit to assist with due diligence activities. The audit included a review of RCRA, CWA, CAA, SARA, and EPCRA requirements and provided recommendations and best management practices to improve facility compliance. Significant issues include waste designations, stormwater and process water management, and employee training.

Environmental Guidance for Tenant Contracting, Port of Portland, Portland, Oregon—Project manager responsible for developing written procedures and flowcharts with assistance from a Port of Portland committee that documents the environmental aspects of the tenant contracting process for short- and long-term use of Port of Portland property. As part of the process, documented roles and responsibilities of Port departments and developed checklists to assist property managers as well as Port environmental coordinators to gather the necessary information to categorize tenants into four risk categories—no risk to greatest risk. Based on the risk category, model contract language developed by the Port of Portland's legal department can be recommended for incorporation into the contract and the type of ongoing environmental monitoring program selected and implemented.

Spill Response, Port of Portland International Airport, Portland, Oregon—For the Portland International Airport, Portland, Oregon, worked closely with Port Aviation Environmental Staff to update the airport SPCC plan. Served as project manager, responsible for updating sections as appropriate and providing for consistency between the two documents.

Environmental Compliance Assessment, Fiber Optic Manufacturer, Portland, Oregon—Project manager for an environmental compliance assessment conducted on behalf of STC Submarine in Portland, Oregon, a manufacturer of underwater fiber-optics cables used in telecommunications. The facility, which is located along the Willamette River, uses water in its quality assurance protocol; that water comes into contact with plastic and is ultimately discharged to the river. Reviewed compliance with relevant regulatory programs, including RCRA, TSCA, and SARA, as well as air and water discharge permits. In addition, prepared an NPDES permit renewal that successfully sought an increase in the volume of water discharged to the Willamette River.

Environmental Program Development, Ship Repair Operation, Portland, Oregon—West State, Inc., a ship repair and maintenance facility, located along the Willamette River, was found by the Oregon DEQ to be out of compliance in handling hazardous wastes, particularly those associated with larger vessels such as oil tankers and commercial cruise ships. Conducted a compliance audit that examined the handling of materials such as bilge water and sludge, paint, and sandblast grit wastes. Also developed a hazardous waste prevention plan, a hazardous waste contingency plan, and emergency procedures; a personnel training plan; and a toxic substances and hazardous waste reduction plan. After helping the client meet deadlines required in a notice of noncompliance and a notice of violation, negotiated with state regulators to reduce the fines in a stipulated penalty.

Stormwater Plans, Port of Portland, Portland, Oregon—Worked closely with Port staff to develop an integrated Stormwater Pollution Control Plan for two General Stormwater

Permits 1200 Z and 1200 COLS for Terminal 6 in the Port of Portland. Tasks included conducting a site visit to identify potential pollutant sources to stormwater, developing best management practices, preparing a 1200 COLS application, sampling procedures, preparing a plan, and participating in the internal management due diligence review of the plan and permit.

Stormwater Compliance, Port of Portland, Portland, Oregon—Served as project manager for the design and implementation of a study to identify the sources of turbidity and total suspended solids (TSS) exceedances discharged to surface water from a large undeveloped area of land. These discharges resulted in exceedances to a 1200 COLS permit. Tasks included meeting with the client to confirm existing knowledge of stormwater piping, reviewing ongoing construction projects and procedures for controlling TSS, and preliminary identification of sources of sediment. This work was accompanied by one day of fieldwork obtaining flow measurements, and TSS samples and turbidity measurements. A stormwater manhole was entered using confined space procedures while other samples were obtained from creeks. Potential sources and data were plotted on a map supported by a memorandum with recommendations for reducing TSS and turbidity.

Stormwater Compliance, Port of Portland, Portland, Oregon—Served as project manager to develop a groundwater sampling plan to assist in understanding the relative contribution of phosphorus from groundwater to a stormwater piping system, which eventually discharges to the surface water. The data are needed to respond to exceedances of the phosphorus benchmark contained in a 1200 COLS permit. The plan will be implemented during the next calendar year and the data tabulated to evaluate the phosphorus contribution to stormwater.

Stormwater Management, Chemical Blending Facility, Portland, Oregon—Evaluated Oregon DEQ's WPCF and UIC program and specific WPCF permits for use at a facility that uses drywells to manage stormwater and was undergoing a remedial investigation in the Voluntary Cleanup Program. To date, Oregon DEQ has not issued an individual WPCF permit to regulate Class V stormwater drywells. Worked with Oregon DEQ to determine the most appropriate strategy to permit these stormwater drywells ("permit by rule" or WPCF). Also assisted with preparing the dry well registration documentation and prepared a formal request to DEQ for "permit by rule" for the drywells. This request required additional research, which included a site visit, review of facility plans, in-pipe camera work, and a detailed evaluation of OAR 340-044-0018 (3) (a)—Authorization of Underground Injection by Rule.

RCRA, CWA, and TSCA Regulatory Support, Steel Mini-Mills, Multi-State Locations—Project manager for providing RCRA, CWA, and TSCA regulatory support to three plant environmental managers and a corporate environmental manager responsible for five major steel-making facilities and a major transportation facility in three western states (Oregon, California, and Colorado). Several of these facilities were located along major rivers requiring unique approaches to compliance. Tasks included assisting facility environmental managers with developing environmental programs by developing goals

and action plans to maintain regulatory compliance and corporate environmental standards.

Site Investigation and Remediation Support

Sediment Remediation for State Voluntary Cleanup Site, Former Ore Transfer Facility, Coos Bay, Oregon—Project manager for a team of engineers and scientists that conducted additional sediment investigations, and designed, permitted, and implemented removal of 2,000 cubic yards of sediment and placement of oyster-friendly habitat and backfill. Specific tasks included negotiating with the Oregon DEQ for cleanup standards, permit requirements, and obtaining a “No Further Action” letter. Was responsible for obtaining permits and approvals from the U.S. Army Corps of Engineers, National Marine Fisheries Service, Oregon Division of State Lands, the City of Coos Bay, and DEQ.

Terminal 4 Engineering Evaluation/Cost Estimate for Non-Time Critical Removal Action, Port of Portland, Portland, Oregon—Served as staff to an environmental program manager to provide coordination to a Port inspector and marine facility tenants during a large field investigation associated with a non-time critical removal action at Terminal 4. Responsibilities included coordination and communication with a Port construction inspector and coordination and communication with two consulting firms during a 2-month time period. In addition, provided assistance for obtaining a DSL permit for sampling activities. A portion of the work was conducted at the Port offices.

As part of a larger team, was responsible for health and safety aspects of a 2-month site characterization project, ARARs analysis, and evaluation of sediment treatment options for contaminated sediments.

Greenway Review, Port of Portland, Portland, Oregon—For the Port of Portland, served as liaison between Environmental Affairs and Port Planning Department to assist with preparing two City of Portland Greenway Review applications for projects related to Oregon DEQ and EPA remediation projects. Responsibilities included summarizing relevant remedial investigation and feasibility study reports, biological assessments, and a Corps/Division of State Land Nationwide Permit 38 application and ensuring that all documents were consistent. In addition, managed and incorporated comments from the Port’s legal, engineering, environmental, and planning staff in the final Greenway Review applications. A portion of the work was conducted at the Port offices.

Permit Plan, Department of Natural Resources, Washington—Served as the task manager for preparing the permitting and approvals and operational permits sections for five different sediment treatment technologies at three potential locations in Washington State. Federal, state, and local regulations were evaluated for each of the technologies to receive sediment from a single user and from multiple users for sites designated as Superfund sites and sites not designated as Superfund sites.

Management of Dredged Material, METRO, Portland, Oregon—Provided technical assistance to the regional solid waste utility for evaluating the implications of managing dredged material as solid waste and at Subtitle D landfills. Tasks included developing potential

scenarios for managing dredged material and evaluating whether the scenarios are regulated under the existing METRO solid waste code. Was selected for this role because of expertise in solid and hazardous waste management and knowledge of current sediment regulatory issues.

Sediment Management, Marine Terminal Transfer Stations, New York Department of Sanitation, New York, New York—As part of a large project team, was responsible for developing the handling and disposal sections of a sediment sampling and analysis plan for eight marine solid waste transfer stations owned and operated by the New York City Sanitation Department. Tasks included evaluating the sediment chemistry data for disposal of sediments at several upland landfills and several treatment/beneficial reuse facilities. This entailed evaluating the data to determine if the sediment was a solid or hazardous waste (RCRA criteria), regulated by TSCA, and met the landfill-specific acceptance criteria. Also evaluated elutriate data to determine appropriate disposal options for dewatering fluid. This entailed evaluating New York State ambient water quality criteria and New York City effluent criteria to sanitary or combined sewers. Also identified acceptable disposal options for sediment and dewatering fluid.

Remedial Investigation, Boat Yard, Coos Bay, Oregon—The Charleston Boat Yard International, Coos Bay, Oregon, was under an order from Oregon DEQ to investigate and remediate contaminated sediments. As task manager, was responsible for evaluating the contribution made by stormwater to the contamination issues and for identifying other sources of contamination. In addition, prepared sections of the remedial investigation report, with responsibility for establishing the site history, identifying past and present land-use issues, and documenting beneficial uses (such as habitat and recreation) of adjacent waters.

Remedial Investigation, Ship Repair Operation Bay, Coos Bay, Oregon—Contaminated sediments at the Southern Oregon Marine International 20-acre shipyard in the Port of Coos Bay, Oregon, were being investigated and remediated under a consent order with Oregon DEQ. Served as task manager, with particular emphasis on establishing past and present land uses, documenting beneficial uses of adjacent waters, evaluating and controlling sources such as stormwater discharge, reviewing best management practices, and permitting. In addition to work on the remedial investigation, supported the shipyard in its response to a DEQ hazardous waste generator inspection that resulted in a notice of violation and a civil penalty.

Property Transactions/Phase I Support

Confidential Client, Evaluation of Environmental Liabilities at Marine Cargo Terminals—Managed an environmental due diligence project to evaluate environmental liabilities at 20 marine cargo terminals offered for sale in a multimillion-dollar transaction. Responsibilities included coordinating with corporate-level in-house engineering staff, in-house counsel, and consulting counsel to implement a strategy that addressed specific environmental liabilities. In addition, managed a team of nine staff professionals, operating from different offices, deployed throughout the United States—Pacific

Northwest, West Coast, East Coast, Southeast, Gulf Coast, Guam, and Puerto Rico—to complete the site visits. Each evaluation included a visual inspection and records and regulatory reviews, with emphasis on such issues as stormwater and air discharge permits, past releases at underground storage tanks, spill prevention training and planning, and the use and storage of hazardous materials. The fieldwork was completed within 2 weeks, on time, and within budget.

On-Call Contract, Port of Portland, Portland, Oregon—Served as client manager for this 8-year, multimillion-dollar contract. As client manager, was responsible for allocating staff resources, identifying needed technical expertise, and ensuring overall client satisfaction. In addition, served as project manager for select elements of the work, including technical assistance on regulatory matters, the tenant management program, compliance audits, and Phase I environmental assessments. Worked with Port staff to develop a tenant lease ranking system to categorize tenants by environmental features to determine the type and frequency of needed Phase I assessments and compliance visits. The contract also addressed a host of upland and waterfront issues, including evaluating approximately 2.5 miles of light-rail alignment on Port property, which was being developed in a public-private partnership. For that component, reviewed site history, aerial photographs, and regulatory lists, and performed site visits to determine what concerns, such as underground storage tanks, might have been encountered along the alignment.

Confidential Client, Evaluate Port Properties, California and Washington—For a confidential client with multiple locations in California and Washington, served as project manager with responsibility for coordinating a team of three staff members in this effort to evaluate port properties for possible use as aggregate unloading, storage, and distribution facilities. The team conducted Internet searches of port facilities, interviewed port real estate managers, conducted site visits, and prepared a final report of its findings. In all, evaluated eight locations in California and three in Washington for availability, size, expansion potential, access to water frontage, water depth, environmental permitting, allowable land uses, annual leasing costs and taxes, and union issues.

PRESENTATIONS

Wexler, R., B. Day, R. Rudnick, K. McCaig, and S. Groth. 2009. Focused remediation and oyster restoration at former ore transfer facility in Coos Bay, OR. Presented at the Battelle Fifth International Conference on Remediation of Contaminated Sediments, Jacksonville, Florida.

Wexler, R., and K. McCaig. 2008. Focused sediment remediation and oyster habitat restoration at former ore transfer facility in Coos Bay, OR. Presented at the 2008 Advanced Sediment Conference, Portland, OR.

Wexler, R. 2007. Successfully managing vendors and contractors. Presented at the 19th Annual Northwest Environmental Conference, Portland, OR.

Wexler, R. 2007. Participant in round table discussion titled "To be green or competitive in the global market place." Presented at the 19th Annual Northwest Environmental Conference, Portland, OR.

Wexler, R. 2006. RCRA basics. Presented at the 18th Annual Northwest Environmental Conference, Portland, OR.

Wexler, R. 2005. RCRA 101 compliance central. Presented at 17th Annual Northwest Environmental Conference, Portland, OR.

Wexler, R. 2004. Environmental audits, inspections and investigations. Presented at 16th Annual Northwest Environmental Conference, Portland, OR.

Wexler, R. 2001. Regulatory aspects of contaminated sediment treatment alternatives analysis. Presented at the Environmental Learning Center Conference, Portland, OR.

Wexler, R. 2000. Moderator: Lessons learned (a round-table discussion of Commencement Bay and Portland Harbor) and "Source control" (a panel discussion on the science and practice of identifying and eliminating sources of sediment contamination). Northwest Environmental Conference, Portland, OR.



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Deborah A. Rudnick, Ph.D.
Senior Scientist

PROFESSIONAL PROFILE

Dr. Deborah Rudnick is an ecologist specializing in the design and execution of complex ecological investigations in upland terrestrial, freshwater, estuarine, and marine environments. In her 15 years of professional experience, Dr. Rudnick has conducted research in population ecology, behavioral and trophic ecology, and invasion biology. She has designed and conducted stable isotope analyses and experimental mesocosms to investigate aquatic food webs. She has implemented research and monitoring of upland terrestrial, riparian and aquatic systems involving biological inventories, riparian restoration, geomorphological studies, macroinvertebrate sampling, water quality monitoring, evaluation of pharmaceutical products in the marine environment, and in-stream improvements for fish and wildlife habitat in a diverse range of geographic regions. Dr. Rudnick has designed exposure models and conducted ecological risk assessments for wood processing facilities, arid upland mining sites, shipping facilities, and urban estuaries. She has conducted site assessments to meet regulatory guidance including biological assessments, essential fish habitat assessments, terrestrial ecological evaluations (TEEs) under the Washington State Model Toxics Control Act (MTCA), and site evaluations under various state-level regulatory programs in Oregon, Colorado, Washington, and Nevada. Dr. Rudnick has provided leadership on research and management teams addressing invasive species and ecosystem health.

CREDENTIALS AND PROFESSIONAL HONORS

Ph.D., Environmental Science, Policy and Management, University of California at Berkeley, Berkeley, California, 2003

B.A., Ecology and Evolutionary Biology, Brown University, Providence, Rhode Island, 1994

Certified Ecologist, Ecological Society of America, 2006

Freitag Award for Excellence in Arthropod Research, University of California at Berkeley, 2003

National Sea Grant Award for Trophic Impacts of Invasive Species Research, 2001

Robert Usinger Award for Excellence in Aquatic Research, University of California at Berkeley, 2001

Sigma Xi Grant in Aid of Research Recipient, 2001

CALFED Grant Recipient for Chinese Mitten Crab Ecology Research, 1999

National Service Award, USDA/AmeriCorps, 1995

Inducted as member, Sigma Xi National Scientific Honors Society, 1994

CONTINUING EDUCATION AND TRAINING

Wetland and Upland Habitat Restoration: University of Washington Professional Short Course, Seattle, Washington, 2007

PROFESSIONAL AFFILIATIONS

Member of American Institute of Biological Sciences

Member of Ecological Society of America

Member of Sigma Xi Scientific Honors Society

Member of Society of Environmental Toxicology and Chemistry

RELEVANT EXPERIENCE

Ecological Risk Assessment

San Jacinto River Waste Pits RI/FS, Clearview, Texas—Completed a screening-level ecological risk assessment for an estuarine environment potentially affected by paper mill waste located on the San Jacinto River. Providing technical assistance to the ongoing site investigation including development of the sediment sampling and analysis plan and the RI/FS work plan.

Preliminary Terrestrial Ecological Evaluation for the Georgetown Steam Plant, Seattle, Washington—Conducted a preliminary TEE, consistent with Washington State's MTCA guidance, for a steam plant within the Duwamish Industrial Complex. Conducted a site survey to characterize the plant community within and adjacent to the site and to determine potential use of the site by local fauna, and was lead author for reporting the TEE findings, which may require a simplified TEE based on screening soil data against benchmark values provided in MTCA guidance.

Quillayute Naval Air Auxiliary Station, Forks, Washington—Conducted a terrestrial ecological evaluation and screening assessment pursuant to the Washington State Model Toxics Control Act to identify contaminants of potential concern for a former army and naval base on the Olympic Peninsula of Washington.

Portland Harbor CERCLA RI/FS, Portland, Oregon—Provided critical review of the baseline ecological risk assessment and remedial investigation documents for the Portland Harbor CERCLA site on behalf of a private client. Evaluated data quality, verified and independently evaluated risk assessment assumptions and calculations, synthesized responses, and created summary memoranda for senior and client review.

St. Regis Paper Company Site, Cass Lake, Minnesota—Developed and implemented quantitative models to estimate exposures of terrestrial and aquatic wildlife to chemical contaminants. Critically reviewed and synthesized information on natural histories of birds and mammals, toxicity of metals, pentachlorophenol, and polycyclic aromatic

hydrocarbons, and bioaccumulation models for fish and invertebrates in support of risk assessment requirements.

Yerington Mine Site, Yerington, Nevada—Supported ecological risk assessment activities for a former mining site in an arid upland ecosystem. Constructed conceptual site models to illustrate contaminant source, transport, and exposure processes in multiple site areas. Critically reviewed and selected toxicity reference values for use in exposure estimates. Developed and implemented quantitative models to estimate exposures of terrestrial and aquatic wildlife to chemical contaminants. Synthesized information on toxicity reference values and natural histories of terrestrial and aquatic wildlife. Developed and critically reviewed sampling approaches for aquatic portions of site.

Natural Resource Assessment and Monitoring

Berry's Creek CERCLA RI/FS, New Jersey—Designed a study using stable isotopes of nitrogen, carbon, and sulfur to evaluate trophic relationships in a tidally influenced, urbanized estuary. Prepared sampling objectives, methods, and cost estimates to support study design.

Upper Columbia River CERCLA Remedial Investigation, Washington—Provided technical support for multiple aspects of remedial investigation work plan and QAPP development. Lead role in preparing aquatic resource inventory, synthesizing spatial and ecological information for the site, and designing a study of metals in zooplankton tissue.

Former Glenbrook Nickel Facility, Coos Bay, Oregon—Conducted a combined biological assessment and essential fish habitat assessment for a former nickel transfer facility in upper Coos Bay along the Oregon Coast. Reviewed and synthesized information for listed and candidate fish and wildlife species and federally managed fish species and evaluated likelihood of ecological effects of a proposed sediment remediation project.

Exxon Valdez Oil Spill, Prince William Sound, Alaska—Performed critical review and synthesis of historical and current scientific information to assess injury and restoration status of resources injured in the 1989 Exxon Valdez oil spill. Technical activities included analysis of documentation relating to the injury assessment, information synthesis, and communication with natural resource experts to incorporate and synthesize comments into response document.

Habitat Restoration

Former Glenbrook Nickel Facility, Coos Bay, Oregon—Assisted in the evaluation of restoration of native oyster communities, including calculating allowable nickel concentrations in salvaged and replanted native oysters on site.

Jefferson County Open Space, Colorado—Conducted timber management, including selective tree thinning and removal, to improve foothills wildlife habitat. Conducted wetland mitigation to offset county development projects, including site selection, excavation, and revegetation.

U.S. Department of Agriculture Public Lands and Environment Program, Vermont—Conducted timber management, prescribed burning, and salmonid stocking to restore wildlife habitat and supplement important fish populations on U.S. forest lands.

Bainbridge Island Watershed Council, Bainbridge Island, Washington—Work in partnership with the City of Bainbridge Island and the Suquamish Tribe of Indians to initiate and coordinate a 4-year salmon supplementation program for Cooper Creek, Bainbridge Island. Oversee permitting, data collection protocols, water quality assessment, and fish health monitoring.

Water Quality Monitoring and Permitting

Littleton-Englewood Wastewater Treatment Plant, Littleton, Colorado—Evaluated the potential for municipal wastewater discharge to the South Platte River to exceed state temperature regulations. Assisted with development of data treatment methods; conducted and reviewed calculations; and synthesized results in a summary report. Prepared successful written testimony requesting site-specific temperature regulations on behalf of client.

Shipyards Site, San Diego, California—Conducted critical review of state of California's reasonable potential analysis to set effluent limitations for the shipbuilder, which was discharging hydraulic and fire protection systems effluent to San Diego Bay. Synthesized and analyzed water quality data and evaluated likelihood to exceed state-proposed effluent chemistry limitations; critically reviewed state's reasonable potential analysis and provided recommendations to client; and developed a site-specific translation factor for metals to explore the effects of alternative criteria development on compliance.

Victoria Capital Regional District, Victoria, British Columbia—Synthesized information and developed recommendations for a program to monitor effects of pharmaceuticals and personal care products on the marine environment affected by municipal wastewaters in British Columbia, Canada.

10,000 Years Institute, Hoh River Water Monitoring Program, Washington—Implemented water quality monitoring program for the Hoh River basin. Conducted fish, amphibian, and stream gradient surveys; measured discrete and long-term water quality parameters using a variety of instrumentation; and conducted substrate classification surveys. Developed quality assurance program plan for water quality monitoring program. Reported data to Hoh Indian Tribe and Olympic National Park scientists and managers.

Ecological Research and Information Synthesis

University of California at Berkeley, Berkeley, California—Designed and executed independent research on the population and community ecology of aquatic invasive species. Employed multiple experimental techniques, including stable isotope analysis with laboratory calibration, experimental mesocosms, monitoring population dynamics using multiple trapping and censusing methods, and behavioral observations. Developed and implemented surveys to quantify invasive species impacts to commercial fisheries. Chaired a multi-agency, multi-institution statewide workgroup to coordinate research and provide management recommendations for the control of Chinese mitten crabs at state and national levels.

City of Seattle, Seattle, Washington—Managed project to synthesize and summarize status of knowledge regarding phthalates in stormwater runoff and sediments. Worked with a team of chemists and ecologists to gather, review, summarize, and present materials to support a multi-agency task force addressing a phthalates-in-sediment contamination issue.

10,000 Years Institute, Bainbridge Island, Washington—Synthesized information for a large-scale literature review of the role of large woody debris in the formation of habitat in forested stream systems of eastern Washington.

Ventana Wilderness Sanctuary, Big Sur, California—Conducted point-count and mist-netting censuses to examine riparian passerine diversity and habitat use. Conducted steelhead trout population monitoring.

Kent Island Research Station, New Brunswick, Canada—Conducted research on avian parental care and offspring success in the Savannah sparrow (*Passerculus sandwichensis*). Conducted mist-netting, banding, blood sample collection, and nest-finding and observation.

PUBLICATIONS

Blumenshine, S., B. Tsukimura, A. Rice, and D. Rudnick. In Review. Environmental factors influencing the dynamics of Chinese mitten crab zoeae in the San Francisco Bay-Delta.

Pastorok, R.A., D. Preziosi, and D. Rudnick. 2008. Ecotoxicological modeling: Models of populations, ecosystems, and landscapes to address risks of toxic chemicals. pp. 1165–1186. In: *Ecotoxicology*. Vol. 2, *Encyclopedia of Ecology*, 5 vols. Jørgensen, S.E., and B.D. Fath (eds). Elsevier, Oxford.

Herborg, L.M., D. Rudnick, Y. Sillang, D.M. Lodge, and H.J. MacIsaac. 2007. Predicting the range of Chinese mitten crabs (*Eriocheir sinensis*) in Europe. *Conserv. Biology* 21:1316–1323.

Rudnick, D., V. Chan, and V. Resh. 2006. Morphology and impacts of the burrows of the Chinese mitten crab, *Eriocheir sinensis* H. Milne Edwards (Decapoda, Grapsoidea), in South San Francisco Bay, CA. *Crustaceana* 78:787–807.

Hui, C., D. Rudnick, and E. Williams. 2005. Mercury burdens in Chinese mitten crabs (*Eriocheir sinensis*) in three tributaries of southern San Francisco Bay, CA. *Environ. Pollut.* 133(3):481–487.

Rudnick, D., C. Culver, K. Hieb, D. Tullis, T. Veldhuizen, and B. Tsukimura. 2005. A life history model for the San Francisco Bay population of the Chinese mitten crab, *Eriocheir sinensis*. *Biol. Invasions* 7(2):333–350.

Rudnick, D., and V. Resh. 2005. Stable isotopes, mesocosms and gut content analysis demonstrate trophic differences in two invasive decapod crustacea. *Freshwat. Biol.* 50:1323–1336.

Rudnick, D., K. Hieb, K. Grimmer, and V. Resh. 2003. Patterns and processes of biological invasion: The Chinese mitten crab in San Francisco Bay. *J. Basic Appl. Ecol.* 4:249–262.

Rudnick, D., and V. Resh. 2002. A survey to examine the effects of the Chinese mitten crab on commercial fisheries in Northern California. *Interagency Ecological Project Newsletter* 15(1):19–21.

Rudnick, D., V. Resh, and K. Halat. 2000. Ecology, distribution and potential impacts of the Chinese mitten crab (*Eriocheir sinensis*) in San Francisco Bay. UCAL-WRC-W-881. University of California, Berkeley, Center for Wildlands and Water Resources, Berkeley, CA.

PRESENTATIONS/POSTERS

Conovitz, A., D. Rudnick, R. Wexler, and L. Williams. 2010. Using long-term ambient water quality data to inform thermal criteria revisions: A case study on the South Platte River, CO. National Water Quality Monitoring Council Conference. Denver, CO.

Rudnick, D., R. Wexler, B. Day, K. McCaig, and S. Groth. 2009. Focused remediation and oyster restoration at former ore transfer facility in Coos Bay, OR. Society of Environmental Toxicology and Chemistry, Pacific Northwest Regional Chapter. Port Townsend, WA.

Wexler, R., B. Day, D. Rudnick, K. McCaig, and S. Groth. 2008. Focused sediment remediation and oyster habitat restoration at a former ore transfer facility in Coos Bay, OR. EPA Brownfields Conference. Tacoma, WA.

Sullivan, J., D. Preziosi, and D. Rudnick. 2008. Ecological land reuse at contaminated sites—planning at the landscape scale. Society of Environmental Toxicology and Chemistry, Chesapeake and Potomac regional chapter meeting. Shepherdstown, WV.

Preziosi, D., J. Sullivan, D. Rudnick, and J. Schmitz. 2007. Ecological land reuse at contaminated sites—planning at the landscape scale. Ecological Society of America and Society of Ecological Restoration joint meeting, San Jose, CA.



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Jane L. Sund

Engineer

PROFESSIONAL PROFILE

Ms. Jane Sund is an engineer with 6 years of professional experience in the environmental field. Ms. Sund has considerable experience conducting site investigations, providing construction oversight, and in-water cap design. Since joining Integral in 2004, Ms. Sund has been involved in numerous field sampling events supporting the Portland Harbor RI/FS. She has extensive experience conducting sediment, surface water, stormwater, groundwater, and soil investigations in upland, freshwater, and estuarine environments. She was also responsible for preparing work plans, sampling and analysis plans (SAPs), budgeting, and coordinating with consultants, subcontractors, and clients. Ms. Sund has performed slope stability analysis using WinSTABL software as part of cap design analysis. She has also prepared technical specifications for construction including but not limited to sediment capping and dredging and excavation specifications. Ms. Sund worked with a team in developing a construction quality assurance plan, water quality management plan, and sediment SAPs as part of design analysis report. Ms. Sund served as field team leader in the collection of sediment cores and surface grabs for geotechnical analysis, and collection of seep water samples for water quality analysis.

CREDENTIALS AND PROFESSIONAL HONORS

M.S., Civil Engineer (Environmental focus), University of Oklahoma, 2000
B.S., Environmental Science, University of Oklahoma, 1996

CONTINUING EDUCATION AND TRAINING

Engineer in Training (EI 12200), State of Oklahoma
Hazardous Waste Operations and Emergency Response 40-hour Certification, current
Hazardous Waste Operations Management and Supervisor 8-hour Certification (2000)
Nuclear Density Testing Equipment Certification, Troxler Labs, Inc. (2001)
First Aid and CPR certified, current

PROFESSIONAL AFFILIATIONS

American Society of Civil Engineers

RELEVANT EXPERIENCE

Engineering Design

Former Glenbrook Nickel Facility Remedial Construction Contract Documents, Coos Bay, Oregon—Worked with a team to provide engineering analysis and technical specifications for construction for the remedial action. Tasks included but were not limited to backfill material design, sediment handling, and sediment and debris disposal.

Slip 4 100% Design Analysis Report, Lower Duwamish Waterway, Seattle, Washington—Performed slope stability analysis using WinSTABL software as part of cap design analysis. Prepared technical specifications for construction including sediment capping and dredging and excavation specifications. Worked with a team in developing a construction quality assurance plan, water quality management plan, and sediment SAPs as part of a design analysis report. Served as field team leader in collection of sediment cores and surface grabs for geotechnical analysis and collection of seep water samples for water quality analysis.

30% Design, Greens Bayou Sediment Action Project, Houston, Texas—Developed geotechnical cross sections and performed slope stability analysis for proposed dredge prism. Assisted in preparation of design drawings and construction specifications. Reviewed facility stormwater management plan and assisted in developing plan to update stormwater management plan for the site and surrounding properties.

Design of Industrial Waste Landfill Cap, Austin, Texas—Worked with a team to design a landfill cap for Class II industrial waste landfill. Used HEC-HMS and FlowMaster to design drainage channel and culvert sizing for stormwater management. Developed technical plans and specifications for construction activities.

Environmental Investigation

Portland Harbor Remedial Investigation and Feasibility Study, Portland, Oregon—Provided field support for the Round 2 and Round 3 collection and processing of sediment (surface and subsurface), surface water, tissue, and transition zone water samples. Trace metal clean sampling techniques were used in the collection of surface water containing ultra-low concentrations of organic compounds using XAD-2 columns. Deployed and collected samples from several types of transition-zone samplers in Portland Harbor, including diffusion-based small- and large-volume peepers and vapor diffusion samplers to ascertain the impact of contaminated groundwater on the biologically active sediment zone. Served as field team leader for Round 3 collection of high- and low-volume surface water samples. Part of a common consultant team to provide operations and maintenance and collect storm water samples from 23 upland facilities within the initial study area. Assisted in the development of health and safety plans and field sampling plans.

Former Glenbrook Nickel Facility Focused Feasibility Study, Coos Bay, Oregon—Worked with team to develop focused feasibility study for sediments as part of a Voluntary Cleanup Action to obtain a No Further Action status for the site. Part of field team in investigation

of sediments at the site. Investigation included the collection of sediment cores and surface grab samples for chemical and physical analysis.

West Bay Berth Deeping and Remediation Project, Port of Olympia, Washington—Served as field team leader in the collection of surface sediment samples for chemical analysis and subsurface cores for chemical and geotechnical analysis. Developed sampling and analysis plan and health and safety plan for the collection of surface and subsurface sediments in order to identify data gaps for design planning purposes. Worked with team to prepare data summary report, which evaluated the extent of dioxin contamination and the geotechnical properties of the sediment to support evaluation of design strategies. Final design and implementation of the project is currently pending the Port's identification of funding sources.

South Park Soil Remediation Project, Seattle, Washington—Served as field investigation coordinator in the collection of soil samples using direct push technology for remedial investigation and design for cleanup of PCB-contaminated soil at a mixed use residential/industrial site encompassing several city blocks located in south Seattle.

Semi-Annual Groundwater Sampling at a Former Wood Waste Disposal Landfill, Oakridge, Oregon—Collected groundwater and surface water samples at a former wood waste landfill site. Analyzed field and analytical data to modify an existing environmental monitoring plan for the site that included a reduced list of analytes.

Soil, Groundwater, and Sediment Investigations at an Industrial Facility, Lake Charles, Louisiana—Prepared budget estimates for project tasks and developed work plans and summary reports for a variety of investigations. Served as field supervisor for site investigations at an industrial facility, including construction oversight, borehole logging, monitoring well installation, and soil sampling. The primary focus of the investigation was the delineation of PCBs and PAHs in soil and VOCs in groundwater. Prepared quantity estimates for removal of PCB-impacted soils. Worked with a team to develop a SAP for the collection of sediment and surface water samples in an industrial ship channel. The objective was to delineate the horizontal and vertical extent of PCB- and PAH-impacted sediment for removal. Served as field supervisor during collection of samples and coordination of work with client and adjoining industrial facility.

Construction Quality Assurance

Remediation of Abandoned Railroad Line, Kellogg, Idaho—Responsible for the office and field support for construction oversight operations, including liaison with design team, state, and federal oversight personnel; review of field submittals, field changes, field purchasing, quality control and quality assurance, and technical documentation; field survey and materials testing (soil and asphalt), and other related support items relating to the remediation of a 75-mile abandoned Union Pacific rail line in northern Idaho.

Research

Use of Lagoons in Treatment of Swine Waste, University of Oklahoma, Norman, Oklahoma— Research focused on lagoons as best management practices for the treatment of waste from a swine concentrated animal feeding operation. Designed a sampler and sampling protocol for the collection of discrete samples within a two-stage lagoon system. Conducted microbial and nutrient analysis using plate counts, high performance liquid chromatography, total organic carbon, and gas chromatography to characterize factors influencing the system. Assisted in other projects that included the construction and sampling of a wetland system for the treatment of acid mine drainage, groundwater sampling, erosion assessments of streams impacted by urbanization, and surface water sampling to determine phosphorous speciation in a river system.

PUBLICATIONS

Sund, J.L., C.J. Evenson, K.A. Strevett, R.W. Nairn, D. Athay, and E. Trawinski. 2001. Nutrient conversions by photosynthetic bacteria in a swine CAFO lagoon. *J. Environ. Qual.* 30:648-652.

Sund, J. 2000. An evaluation of swine waste lagoons for best management practices. Thesis. University of Oklahoma.

Nick Varnum, R.G.
Geologist

PROFESSIONAL PROFILE

Mr. Nick Varnum is a registered professional geologist with more than 20 years of experience in the assessment of hydrogeology, aqueous geochemistry, and transport and fate of chemicals in hydrogeologic systems. He specializes in managing complex sites and environmental issues for clients with multiple sites and projects with multiple stakeholders, and has provided comprehensive services from initial site research and historical reviews through site characterization and analysis of remedial options and, ultimately, to the design, construction, and implementation of final corrective actions. His technical expertise also includes a variety of engineering geology projects including geotechnical assessments, design of major earthwork structures such as heap leach pads and tailing dams, static and dynamic slope stability evaluations, seismic studies, geological hazard assessments, erosion and sedimentation studies, watershed assessments, and water supply development.

Accomplished at developing innovative approaches for site characterization and strategies for negotiating streamlined site closures with regulatory agencies, Mr. Varnum has directed projects in the Oregon Department of Environmental Quality (DEQ) Voluntary Cleanup Program underground storage tank (UST) cleanup, site response, and site assessment sections, and he has had direct involvement in successful agency negotiations with California Regional Water Quality Control boards, the Washington State Department of Ecology (Ecology), EPA Region 10, and other state and EPA regional jurisdictions. He has managed the investigation and cleanup of hazardous waste sites in the Pacific Northwest, Alaska, Hawaii, and Eastern Europe.

Mr. Varnum has experience addressing soil and groundwater contamination issues at sites affected by a range of chemicals that includes petroleum hydrocarbons, creosote, pentachlorophenol, trichloroethene, tetrachloroethene, other chlorinated solvents, pesticides (including DDT and 2,4-D), polychlorinated biphenyls (PCBs), dioxins and furans, and metals. He has provided environmental consulting services to a wide variety of clients including major oil companies, convenience store chains, major industry, mining companies, seafood processors, real estate developers, insurance companies, municipalities, county and federal agencies, and regulatory agencies (Oregon DEQ).

Mr. Varnum's environmental litigation experience includes developing expert testimony for contaminated sites. This work has included evaluating the source, extent, and cause and timing of contaminant releases, developing questions for depositions, developing strategies, and providing cost allocation and other technical support.

CREDENTIALS AND PROFESSIONAL HONORS

M.S., Geological Engineering, University of Nevada, Reno, 1987

B.A., Geology, Humboldt State University, Arcata, California, 1981

Registered Professional Geologist: Oregon, #G1166; Washington #706

CONTINUING EDUCATION AND TRAINING

Hazardous Waste Operations and Emergency Response 40-hour Certification

Hazardous Waste Operations Management and Supervisor 8-hour Certification

OSHA 29 CFR 1910-120 8-hour refresher course, 1988–2006

RELEVANT EXPERIENCE

Portland Harbor Superfund Site, Portland, Oregon—Lead hydrogeologist for Integral’s support of the Lower Willamette Group. Activities over a period of 6 years have included managing the development of the conceptual site model and tracking the status of upland sources at more than 80 sites, providing technical direction for surface water and groundwater sampling programs, designing sediment investigations, and taking a lead role on major reports and memoranda for the remedial investigation.

Engineering Evaluation/Cost Analysis, Seattle, Washington—Project manager for the engineering evaluation/cost analysis of Terminal 117 project in Seattle. The project included determining the nature and extent of PCBs, petroleum, PAHs, arsenic, and dioxin contamination in city streets and the residential neighborhoods adjacent to a former asphalt facility, an early action area on the bank of the Lower Duwamish Waterway. Sampling methods for this project included multiple-increment sampling in the residential yards. Responsibilities included coordination of efforts among the City of Seattle, Port of Seattle, and EPA, development of cleanup strategies and removal action levels consistent with both EPA and Ecology regulations.

Interim Action for PCB-Contaminated Soil, Seattle, Washington—Provided leading management services for the design and implementation of soil and groundwater investigations to develop strategies for an interim removal action at a property ordered to undergo fast-track cleanup by Ecology over concerns that the property had the potential for impacting sediments in Slip 4 in the Lower Duwamish Waterway.

Human Health and Ecological Risk Assessments, Columbia Slough, Portland, Oregon—Assisted client in successfully negotiating an interim removal action measure for sediment cleanup in the Slough for the Atlas Copco Wagner site with Oregon DEQ utilizing the resources of the local irrigation district at a minimal cost to the client. The project included a human health and ecological risk assessment to identify area for remediation, removal of impacted sediments, and a residual risk assessment. The work is featured in DEQ’s *Columbia Slough Sediment Project Update*—May 2003.

Site Assessment and Human and Ecological Risk Assessment, Johnson Creek, Portland, Oregon—The investigation included assessment of metals, PAH, VOC, and PCB contaminants in soil, groundwater and sediments in the creek. Based on the results of the human health and ecological risk assessments, remedial actions were limited to storm water control and removal of a limited volume of sediment associated with storm water discharge. This is the first study in this major Portland Urban Watershed since the implementation of the current revision of Oregon's cleanup rules. The ecological assessment is being used as an example of ecological evaluations in DEQ internal clearing house discussions.

Hydrogeologic Evaluation of Former Pulp and Paper Facility, Port Angeles, Washington—Managed the hydrogeologic investigation of a 100-year-old pulp and paper facility. Work included evaluating a large body of historical data, developing sampling protocols for detection limits meeting very low aquatic water quality criteria, evaluating tidal influences and aquifer characteristics, and preparing a remedial investigation report under Ecology administrative procedures.

Risk-Based Methods Applied to Paint Manufacturing Releases, Portland, Oregon—For a paint manufacturing company that had releases of solvents from USTs, developed risk-based cleanup levels for solvents using Oregon DEQ risk-based decision making procedures and demonstrated that residual concentrations in soil did not pose unacceptable risk and were not responsible for low concentrations of other solvents detected in groundwater.

Evanite Fiber Corporation Corrective Action Program, Oregon—As manager of the corrective action program, developed the scope of work for the first transition of corrective actions from RCRA to Oregon DEQ's Cleanup Program under EPA's amended regulations for alternative authorities for units requiring post-closure permits. Successfully negotiated a focused remedial investigation utilizing existing data to develop risk-based cleanup levels and corrective actions for groundwater and soil impacted by chlorinated solvents.

North Portland Health Clinic Remediation Project, Multnomah County, Oregon—Assessment and cleanup of a former industrial site that was condemned by the county for fast-track redevelopment. Contaminants of concern were identified prior to construction and include chlorinated solvents and fuel hydrocarbons. Assessment and cleanup was implemented under Oregon DEQ's Independent Cleanup Program in a manner that will have minimum impact on the urgent construction schedule.

Remedial Investigations at Alkali Lake, Oregon—Managed field activities for remedial investigations at Alkali Lake. Management activities included amending work plans; providing cost estimates; developing logistics for a remote high desert site; organizing and leading field investigations to sample soil, groundwater, and air; and providing monthly progress reports to the client. Later participated in evaluating the feasibility of installing a subsurface barrier to contain contaminated groundwater.

Consulting Services for Convenience Store Fueling Stations, Oregon and Washington—Provided management and consulting services for convenience stores with retail fueling services in Oregon and Washington between 1995 and 2002. Work included Phase I and Phase II

environmental site assessments for developing properties, conducting site assessments and site characterization for seven properties, and obtaining no-further-action determinations at two sites, working with insurance companies and attorneys representing the client, developing long-term relationships with Oregon DEQ site managers, and directing all environmental activities at the sites.

Human Health Risk Evaluation of Gasoline Contamination at a Former Gasoline Station, Prineville, Oregon—Managed the human health risk evaluation of a former gasoline station. Shallow groundwater and an abundance of gas stations (past and present) had resulted in impacts to much of the downtown area, including vapor problems in downtown businesses. Closely examined the soil moisture, soil density, and pore volume parameters of Oregon DEQ's risk-based corrective action (RBCA) models for vapor intrusion.

RBCA Closure of a Multiparty Site Involving Three Retail Gasoline Stations and Oregon Department of Transportation (ODOT), Oregon—Performed an RBCA assessment of a site with a 600-ft plume, the results of which successfully prevented further remedial efforts based on low risk. Oregon DEQ was originally requiring expensive and independent remedial measures in an effort to treat the groundwater. Negotiations with DEQ resulted in approval of a multi-site assessment, and additional investigation tasks were coordinated with ODOT geotechnical investigations.

Consulting Services for a Municipal Water Supply Canal, Lebanon, Oregon—Managed consulting services provided during the installation of a city's major sewer improvement project that crossed a water supply canal for a neighboring city in an area of contaminated soil and groundwater. Reviewed reports and data associated with impacted soil and groundwater and designed and implemented surface water, sediment, soil, and groundwater investigations. Key participants in stakeholder meetings included representatives from multiple DEQ programs, current and former property owners, and the two cities.

RBCA Assessment for a Dairy Facility, Portland Oregon—Conducted an RBCA assessment that resulted in the cessation of 8 years of groundwater monitoring and no-further-action determination.

Compilation of Data on Lead and Arsenic Contamination in Soil, Sediment, Groundwater, and Surface Water for an Industrial Site, Ohio—Participated in preparation of a RCRA remedial investigation work plan, sampling and analysis plan, and quality assurance project plan and cost estimates for implementing the work plan.

RCRA Clean Closure Equivalency Demonstration for an Industrial Site, Ohio—Prepared and implemented the work plan and sampling and analysis plan for a clean closure equivalency demonstration for a lead-contaminated industrial site. Demonstration was successful.

Site Assessment for Proposed Land Purchase, Honolulu, Hawaii—Evaluated the results of site assessment activities and chemical analysis of soil and groundwater for a proposed land purchase for the Honolulu International Airport. Wrote summary report and provided recommendations for further investigation and remedial alternatives.

Oversight of Battery Recycling Plant Cleanup, Oregon—Managed a program to perform oversight services for Oregon DEQ for the removal of 30,000 tons of slag, matte, and soil contaminated with lead, arsenic, and barium from a former battery recycling plant.

Oversight Services for Site Investigation and Soil and Groundwater Remediation, Portland, Oregon—Provided project management including assisting contractors in planning site investigations, reviewing site assessment reports, interfacing with regulatory agencies, researching remediation options, providing cost estimates, and writing corrective action plans.

Evaluation of Transport Pathways of a 50,000-gal Diesel Spill at a U.S. Navy Fuel Depot, Manchester, Washington—Designed, sited, and supervised the construction of a recovery system, which included total fluid and product extraction systems, interception trenches, and recovery wells.

Remediation of Hydrocarbons Released from Above-Grade Storage Tanks, Oregon—Managed a project involving cleanup of hydrocarbons released from above-grade storage tanks that affected soil and groundwater and a nearby river. Provided technical support during negotiations with Oregon DEQ's Voluntary Cleanup Program. An aggressive cleanup schedule resulted in application of DEQ's UST rules for guidance and compliance and virtually eliminated the RI/FS process for this site.

Feasibility Study for a Chemical Manufacturing Site, Southern California—Provided support for a feasibility study that examined the use of vapor extraction, groundwater pumping, and treating and gated air sparging to remediate benzene present in soil and groundwater and as free-phase product.

UST Remediation at Service Stations, Oregon—Supervised tank removals, designed and implemented soil and groundwater monitoring program, and wrote corrective action plans. Designed and supervised the installation of vapor extraction, thin-lift aeration, and vented biotreatment mound systems.

Soil Removal and Investigation Project, Portland, Oregon—Managed a soil removal and investigation project that resulted in leaving 110 cubic yards of petroleum-contaminated soil in place and obtaining a no-further-action determination from Oregon DEQ.

Evaluation of Petroleum Hydrocarbon Contamination in Subsurface Soil, Portland, Oregon—Designed and implemented a soil sampling program to evaluate the extent of subsurface soil affected by petroleum hydrocarbons. The sampling results demonstrated that impacted soil posed no environmental risks, and DEQ approved the decision to leave 350 cubic yards of soil in place and issued a no-further-action letter.

Remediation of Petroleum-Contaminated Soil, Portland, Oregon—Designed a remediation system consisting of installing air sparging and vapor extraction components in an interception trench. The system effectively treated petroleum-contaminated soil onsite and groundwater flowing offsite.

Groundwater Investigations, Portland, Oregon—Implemented and managed contractors in the removal of 6,000 tons of petroleum-contaminated soil and subsequent soil and groundwater investigations.

Soil and Groundwater Sampling, Bingen, Washington—Designed and managed a soil and groundwater sampling project at a petroleum bulk fuel plant.

Fish Processing Facility, Bristol Bay, Alaska—Prepared a sampling and analysis plan to evaluate subsurface conditions with regard to applicable regulations, evaluated existing vapor extraction systems and fuel recovery operations, and provided recommendations for corrective action for a fish processing facility.

UST Management Program for School District, Beaverton, Oregon—Wrote bid specifications for UST remedial contractors, selected contractor, planned and conducted soil and groundwater sampling program, and designed corrective action, which included soil excavation and disposal at a landfill or treatment by thin-lift aeration.

Site Investigation of a Pulp and Paper Mill, Vancouver, Washington—Planned and implemented a site investigation at a pulp and paper mill facility, which included sampling soil, effluent, and groundwater for organic and inorganic contaminants.

Containment Systems for Heap Leach Facilities, Central Nevada—Designed containment systems for leachate. Design elements included earthwork grading, surface water runoff control and routing, synthetic and amended soil liners, leachate recovery system, road design, fire control, processing and sanitary facilities, and groundwater monitoring program. Deliverables included a design report, plans, specifications, and cost estimates.

Leachate Containment System for a Heap Leach Facility, South Dakota—Coordinated QA/QC for the installation of the leachate containment system. The installation consisted of an amended clay liner, asphaltic concrete, leachate collection system, and heavy-duty polyethylene liners.

Review of a Proposed Hazardous Waste Impoundment Underdrain and Liner System at a Hazardous Waste Landfill Facility, Southern California—Assessed the feasibility, long-term effectiveness, and likelihood of failure under current and post-closure conditions.

Leachability Column Tests, Location—Designed and conducted cyanide leachability column tests and developed distribution coefficients at heap leach facilities for mining and metallurgical clients.

Feasibility Study Evaluations of Smelter Hill, Anaconda, Montana—Evaluated storm water pathways and structural controls at Smelter Hill. The work was completed in support of feasibility studies for the Clark Fork Superfund Site.

Engineering Geology

Technical Support for Slope Stability Restoration, Multnomah County, Oregon—Immediately following the 1996 floods, provided technical support to restore slope stability. Work

included mapping landslides along county roads and preparing preliminary drawing and specifications for restoration.

Development of Computer Programs to Estimate Seismic Events, Nevada—Developed computer programs to evaluate probabilistic estimates of maximum seismic magnitude and acceleration for Nevada and surrounding areas of the Great Basin. The program was approved for use by the State of Nevada for estimating seismic risk at mining sites and developing pseudo-static slope stability parameters.

Haul Road System, Central Nevada—Designed a haul road that was 17 miles long and had more than 5,000 ft of relief. Deliverables included engineering reports, design drawings with horizontal and vertical alignments, specifications, and cost estimates.

Feasibility Evaluation at a Coal Mine, West-Central Washington—To evaluate the feasibility of placing 10–15 million cubic yards of coal mining overburden (spoil) at a site, conducted geotechnical review of existing data; developed cross sections and volumetrics for configuration analysis; developed static and pseudo-static slope stability parameters, consolidation predictions, and drainage layout and sizing; and prepared a feasibility report and cost estimates.

Seismic Hazard Evaluation, Nevada—Provided technical support for an assessment of seismic hazards associated with the proposed Yucca Mountain Nuclear Water Repository.

Geologic Hazards Evaluation, Reno, Nevada—Evaluated slope stability and flooding potential for a proposed ski resort located near Reno, Nevada.

Development of Industrial Groundwater Supply System, Tonkin Springs, Nevada—Designed and supervised the installation of two water supply wells (700 and 900 ft deep), conducted geophysical and aquifer tests, and designed pumping and conveyance systems.

Data Analysis for Hydraulic Transport Research Facility, Location—Analyzed data to determine the physical parameters of slurry transport through pipelines and develop empirical equations that described the process.

Geological Evaluation of Las Vegas Valley, Nevada—Assessed 10 years of leveling data to evaluate differential movement across fault scarps due to historical groundwater withdrawal and subsequent soil compaction.

Erosion and Sedimentation Analysis for a Watershed, Central California—Compared current conditions of a 15-mi² watershed with those of pre-mining exploration and off-road vehicle use and evaluated the effect of sediment control structures.

Non-point Source Erosion Study of California North Coast River Systems, California—Developed and produced maps of sediment source features, soils, geology, and land use. Designed and implemented stream monitoring system and characterized stream segments using U.S. Forest Service methods.

Storm Water Permitting Support, Oregon—Obtained storm water permits and developed storm water control plans for more than 200 gravel mines and rock quarries under a single

NPDES rule administered by the State of Oregon. The storm water plans for these quarries included guidelines for quarry operators to emplace simple controls to reduce or eliminate storm water discharge and requirements for sampling.

Permitting Support for Sawmills and Log Yards, Oregon and Washington—Obtained storm water permits and developed storm water control plans for sawmills and log yards in southern Washington and northwest Oregon.

Surface Water and Groundwater Monitoring Program, Redwood National Park, California—Managed a monitoring program to evaluate surface water and groundwater hydrology, slope stability, and sediment discharge.

Technical Support to the Yamhill Basin Council, Oregon—Provided technical review of watershed assessment documents for stream systems in the Yamhill River Basin in accordance with Oregon's watershed guidance.

PUBLICATIONS

Varnum, N.C., P.T. Tueller, and C.M. Skau. 1991. A geographic information system to assess natural hazards in the east-central Sierra Nevada. *Imaging Tech.* 17(2)57-61.

Varnum, N.C. 1987. Results of leveling across fault scarps in the Las Vegas Valley, Nevada, April 1978–April 1987. Open-file Report 87-7. Nevada Bureau of Mines and Geology.

Varnum, N.C., and V.L. Ozaki. 1984. Recent channel adjustments in Redwood Creek, California, 1974–1984. Redwood National Park Technical Report 18.

Varnum, N.C., M.A. Madej, and C.O. O'Sullivan. 1986. Hydrology, land-use and sedimentation in the Mill Creek watershed. Redwood National Park Technical Report 17.

Varnum, N.C., C.M. Skau, and P.J. Tueller. 1986. Water related hazards of the east-central Sierra Nevada. Technical Report 43013. Desert Research Institute, University of Nevada System, Water Resources Center.

Varnum, N.C., and V.L. Ozaki. 1985. Recent channel changes in Redwood Creek, CA (abs.). In: Guidebook of the American Geomorphological Field Group, 1985 Northwestern California Conference.

Varnum, N.C. 1984. Channel changes at cross sections in Redwood Creek, California. Redwood National Park Technical Report 12.

Varnum, N.C., and J. Howard. 1982. Thomes Creek watershed study. California Department of Water Resources, Northern District Technical Report.

Varnum, N.C., M. Berry, and S. James. 1982. Mad River watershed erosion study. California Department of Water Resources, Northern District Technical Report.

James A. Brennan, ASLA
Principal
Landscape Architect

Education

Bachelor of Landscape
Architecture, University of
Washington, Seattle, WA, 1983

Professional
Licenses/Registration

Landscape Architect
State of Washington, 1986

Experience

28 years

Joined Firm

1985

Relevant Expertise

Shoreline Restoration

Waterfront Park Design

Environmental Enhancement

Recreation & Education
Programming

Honors and Awards

Taylor Dock and Upland Park
Washington Recreation and
Park Association Spotlight
Facility & Park Award, 2007
and the Waterfront Center's
Honor Award, 2007

Herring's House Park, The
Waterfront Center's
International Top Honor Award,
2002

City of Eureka Inner Channel
Dock and Boardwalk
Revitalization, Distinguished
Project of the Year, North
Coast (California) Region 2002,
American Public Works
Association

Jim Brennan, as principal of J.A. Brennan Associates, is responsible for a diverse range of landscape architectural design and planning projects. Jim's experience includes site selection and comprehensive planning through design development, construction documents, and construction observation. Jim is committed to providing imaginative solutions that produce the best fit between the project objectives and excellence in site planning and design. Jim has a particular interest in the planning and design of shorelines and waterfront areas for public enjoyment and understanding, without compromising conservation objectives.

Waterfront Design Projects

Jim specializes in planning and designing waterfront parks. He has developed a depth of experience that ranges from active to passive recreation facilities, educational trail systems, urban parks, and the preservation and enhancement of sensitive natural areas. He has designed downtown waterfront parks, resorts, recreation areas and natural systems enhancement projects.

Environmental Enhancement

Maximizing design potential in natural systems is the focus of much of Jim's research and design experience. His designs enhance and restore wildlife and fisheries habitat, and plant communities. He has experience working within the permitting framework to produce successful waterfront projects.

Public Involvement / Charrette Facilitation

Jim has focused his career on projects that are of current interest to the community or in sensitive environments where communication and involvement with public groups and individuals is critical to the project's success. Facilitation of public meetings and design charrettes, working with stakeholder groups, and resolving critical community issues are all areas of Jim's expertise.

Project Examples

Terminal 117 Study, Port of Seattle, Seattle, Washington

Jim collaborated with engineers to develop alternative concept plans for restoring this contaminated site along the Duwamish River in Seattle. The graphics developed convey design ideas to stakeholders and the public.

Elliott Bay Seawall Replacement Project, City of Seattle, Seattle, WA

Jim, as project landscape architect, is developing alternatives for the Seattle downtown waterfront's new shoreline edge that celebrate the uniqueness of the City of Seattle and its place on Elliott Bay. The design involves the creation of natural beach touch-points, salmon friendly shallow water habitat, and gathering places along the water's edge.

Terminal 107 Public Access Master Plan, Port of Seattle, Seattle, WA

Jim led a multi-disciplinary team for the development of a shoreline park that preserves archaeological resources and incorporates art elements. Jim developed the park's master plan and construction documents and was also responsible for project permitting support.

Herring's House Park, Seattle, WA

Jim managed a twelve member multi-disciplinary team for this award winning park design, which entailed soils remediation and intertidal marsh creation. Project elements included shoreline design, grading design, planting design, agency and tribal coordination, cost estimating and environmental planning.

James A. Brennan, ASLA
Principal
Landscape Architect

Expertise

Permitting Implications

Funding Opportunities

Facilitating the Public Process

Presentations / Published Articles

"Open Space Design"
Presented at the Yilan County
Open Space Forum in Taiwan,
Spring 2010

"Natural Shoreline Design"
Bremerton Urban Waterfront
Revitalization Conference and
the Victoria B.C. Greenshores
Conference, Fall 2008

"Cultural Landscapes,"
Presented to the Washington
State Department of Parks and
Recreation, 2003

"Telling the Story in the Land,"
Daily Journal of Commerce,
Seattle, April 10, 2003

"Public Art in Overall Campus
Planning," Presented at the
2002 International Public Art
Symposium, Taipei, Taiwan

Don Morse Park Shoreline Restoration, Chelan, WA

Jim is serving as principal-in-charge of a project that will restore Don Morse Park's shoreline and provide a new marina at Chelan's signature waterfront park. The design restores the park's sandy swimming beach, offers an enlarged marina, and enhances park connections with a new esplanade.

Tacoma Chinese Reconciliation Park Project, Tacoma, WA

Jim served as principal-in-charge for a four-acre waterfront park along Ruston Way in Tacoma. The project includes waterfront enhancement, a traditional Chinese garden, environmental art, and interpretive elements. Jim worked with the City, the Chinese Reconciliation Foundation, and the Community in developing plans for this educational park.

Juanita Beach Park Master Plan and Phase 1 Implementation, Kirkland, WA

Jim, as principal-in-charge, led the development of a park master plan and phase one implementation for the rejuvenation of Juanita Beach Park. The design creates better connections to the surrounding community, improves water quality at the swimming beach, enhances stream habitat, and improves active recreation features of the park.

Seward Park Salmon Habitat Improvements, Seattle Parks, Seattle, WA

Jim developed the design for a series of pocket beaches to replace a failing concrete block revetment along the southern shore of Seward Park. Working closely with Seattle Parks, the team developed construction documents for a new salmon-friendly shoreline.

Eureka Inner Channel Dock and Boardwalk Revitalization, Eureka, CA

As project landscape architect, Jim developed a design theme for the revitalization of the downtown waterfront in Eureka California. Jim designed new focal points, including a ship-mast sculpture representing the days of ship building in Eureka. Jim assisted the city in creating public/private partnerships with adjacent landowners and developers with an eye towards creating a vital waterfront entertainment and recreation area and a working waterfront.

Green Island Resort Master Plan, Taiwan, R.O.C.

As project landscape architect, Jim was responsible detail design for the resort and recreational development, which included marinas, cottages, marine parks, dive facilities, and hotel sites for the entire 170 square kilometer island.

Indian Island Cultural and Environmental Restoration, Eureka, CA

Jim served as project manager responsible for the conceptual design of the Wiyot Tribe landowners' Indian Island Cultural and Environmental Restoration Project. Indian Island is a 60-acre archeological site where over 100 Wiyot people died during a massacre in 1856. Elements of the design include a dock, ceremonial areas, and educational facilities.

Taylor Avenue Dock, Bellingham, WA

Jim designed a waterfront park and overwater trail along Bellingham's waterfront. His responsibilities included for master plan development and design detailing of the waterfront park and dock amenities which required railings, lighting, seating, and other site furniture selection.

E. RESUMES OF KEY PERSONNEL PROPOSED FOR THIS CONTRACT

(Complete one Section E for each key person.)

12. NAME John E. Zipper, PE	13. ROLE IN THIS CONTRACT Geotechnical Principal	14. YEARS EXPERIENCE a. TOTAL 32 b. WITH CURRENT FIRM 6	
15. FIRM NAME AND LOCATION (City and State) Terracon Consultants, Inc., Mountlake Terrace, WA			
16. EDUCATION (Degree and Specialization) B.S. Civil Engineering – Geotechnical		17. CURRENT PROFESSIONAL REGISTRATION (State and Discipline) Washington / Idaho / Civil Engineer	
18. OTHER PROFESSIONAL QUALIFICATIONS (Publications, Organizations, Training, Awards, etc.) American Society of Civil Engineers International Society of Soil Mechanics and Foundation Engineering American Public Works Association			
19. RELEVANT PROJECTS			
a.	(1) TITLE AND LOCATION (City and State) Lynnwood Convention Center, Lynnwood, Washington		(2) YEAR COMPLETED PROFESSIONAL SERVICES 2004 CONSTRUCTION (if applicable) 2005
	(3) BRIEF DESCRIPTION (Brief Scope, Size, Cost, etc.) AND SPECIFIC ROLE <input checked="" type="checkbox"/> Check if project performed with current firm Principal Engineer for geotechnical evaluation which included addressing design & construction aspects of the building foundations and appurtenances. Also completed a groundwater modeling analysis of alternative surface water infiltration facility configurations.		
b.	(1) TITLE AND LOCATION (City and State) City of Edmonds, Critical Areas Ordinance Revision and Meadowdale Slide Area		(2) YEAR COMPLETED PROFESSIONAL SERVICES 2007 on-call CONSTRUCTION (if applicable)
	(3) BRIEF DESCRIPTION (Brief Scope, Size, Cost, etc.) AND SPECIFIC ROLE <input checked="" type="checkbox"/> Check if project performed with current firm John Zipper was responsible for engineering analysis and consultations to the Planning Department and City Council for revisions to the Edmonds Critical Areas Ordinance. Intent of recommendations was to provide for development in steep slopes where such development does not create adverse geologic, erosion, or stability impacts. Performed geotechnical review of several residential construction permit applications within the Meadowdale Slide area, coordinated with the Building and Engineering Departments.		
c.	(1) TITLE AND LOCATION (City and State) 1700 Seventh Avenue, Seattle, Washington		(2) YEAR COMPLETED PROFESSIONAL SERVICES 2002 CONSTRUCTION (if applicable) 2002
	(3) BRIEF DESCRIPTION (Brief Scope, Size, Cost, etc.) AND SPECIFIC ROLE <input checked="" type="checkbox"/> Check if project performed with current firm Provided geotechnical and environmental engineering services for this 20-story high rise with 80-foot basement excavation depth. During excavation, contaminated soils were encountered. Extensive testing and remediation was done, and the site received a “No Further Action” determination from Ecology. John Zipper served as Principal Engineer and Project Manager.		
d.	(1) TITLE AND LOCATION (City and State) Alderwood Mall Expansion, Lynnwood, Washington		(2) YEAR COMPLETED PROFESSIONAL SERVICES 2004 - 2005 CONSTRUCTION (if applicable) 2007
	(3) BRIEF DESCRIPTION (Brief Scope, Size, Cost, etc.) AND SPECIFIC ROLE <input checked="" type="checkbox"/> Check if project performed with current firm Terracon completed geotechnical design and consulting for a \$140 million redevelopment project at Alderwood Mall. The project included a new Nordstrom store at the north side of the existing mall, two 3-story parking structures, approximately 300,000 square feet of new retail buildings in a “village” setting, and a ~100,000 square foot theater. John Zipper served as Principal Engineer.		
e.	(1) TITLE AND LOCATION (City and State) Replacement of Water Transmission Lines 2 & 3, Phase 6 Project, Everett, Washington		(2) YEAR COMPLETED PROFESSIONAL SERVICES 2008 CONSTRUCTION (if applicable) 2009
	(3) BRIEF DESCRIPTION (Brief Scope, Size, Cost, etc.) AND SPECIFIC ROLE <input checked="" type="checkbox"/> Check if project performed with current firm Phase 6 of the City of Everett waterline replacement project consists of replacing existing elevated Pipelines Nos. 2 and 3, which have a total length of approximately 4,000 lineal feet. Terracon’s site investigation supplemented explorations completed by others, and allowed us to provide shear wave velocity information for use in seismic evaluation, and to provide soil samples for laboratory testing. Geotechnical recommendations were developed for pile foundation support of the new elevated pipelines and the dike crossing at Deadwater Slough. John Zipper served as Principal Engineer and Project Manager.		

Appendix B

Contact Information

T-117 EAA Recurring Contacts Information**07/11/2011**

Name	Role	Organization	Business Phone	Mobile Phone	e-mail Address
Agency and Stakeholder					
Piper Peterson	EPA RPM	EPA Region 10	(206) 553-4951	(206) 719-0740	peterson.piper@epa.gov
Rick Thomas	Ecology PM	Ecology	(425) 649-7208	-	rith461@ecy.wa.gov
Shelia Eckman	EPA Unit Manager	EPA Region 10	(206) 553-0455	-	eckman.sheila@epa.gov
Lon Kissinger	EPA Risk Eval. Lead	EPA Region 10	(206) 553-2115	-	kissinger.lon@epa.gov
Greg Glass	EPA	Gregory L Glass Env.	(206) 523-1858	-	gglassenviro@comcast.net
Bernie Zavala	EPA Groundwater Lead	EPA Region 10	-	-	zavala.bernie@epa.gov
Travis Shaw	EPA	US Army Corps of Eng	(206) 764-3527	(206) 351-8219	Travis.c.shaw@usace.army.mil
Kris Flint	EPA Source Control	EPA Region 10	(206) 553-8155	-	flint.kris@epa.gov
Marla Steinhoff	Stakeholder Rep	NOAA	(206) 526-6341	-	Marla.Steinhoff@noaa.gov
Jessica Winter	Marla's Alternate	NOAA	-	-	Jessica.Winter@noaa.gov
Glen St. Amant	Stakeholder Rep	Muckleshoot Tribe	(253) 939-3311	(206) 816-4122	gstamant@muckleshoot.nsn.us
Alison O'Sullivan	Stakeholder Rep	Suquamish Tribe	(360)-394-8447	-	aosullivan@suquamish.nsn.us
James Rassmusen	Community Rep & Technical Support	DRCC	(206) 954-0218	-	james@duwamishcleanup.org
Heather Trim		People for Puget Sound	(206) 382-7007	-	htrim@pugetsound.org
Linn Gould		Erda Environmental	(206) 324-0297	-	erdaenv@gmail.com
Elmer Diaz	DOH Consultation	WA Dept of Health	(877) 485-7316	-	Elmer.Diaz@DOH.WA.GOV
Erin Kochaniewicz	DOH Comm. Outreach	WA Dept of Health	(360) 236-3358	-	Erin.Kochaniewicz@DOH.WA.GOV
Port of Seattle and City of Seattle Management					
Brett Richardson	City PM	City of Seattle (SCL)	(206) 233-7224	(206) 718-8161	brett.richardson@seattle.gov
Tom Meyer	City Support	City of Seattle (SCL)	(206) 386-9168	(206) 419-1203	tom.meyer@Seattle.gov
Lynn Best	City Dept. Manager	City of Seattle (SCL)	(206) 386-4586	-	lynn.best@Seattle.gov
Bill Devereaux	Unit Manager/Policy	City of Seattle (SCL)	(206) 386-4577	(206) 659-3622	william.devereaux@seattle.gov
Beth Schmoyer	City SPU Source Control	City of Seattle (SPU)	(206) 386-1199	(206) 218-9382	beth.schmoyer@seattle.gov
Roy Kuroiwa	Project Coordinator	Port of Seattle	(206) 787-3814	(206) 310-7446	kuroiwa.r@portseattle.org
Ticson Mach	Port Capital PM	Port of Seattle	(206) 787-3815	(206) 225-8235	mach.t@portseattle.org
Kathy Bahnick	Policy Advisor	Port of Seattle	(206) 787-3128	(206) 979-7089	bahnick.k@portseattle.org
Stephanie S-Jones	Dept Manager	Port of Seattle	(206) 787-3818	(206) 979-0956	jonesstebbins.s@portseattle.org
Public Relations/Community Outreach					
Suzanne Skadowski	EPA Public Relations	EPA Region 10	(206) 553-1889	-	skadowski.suzanne@epamail.epa.gov
Penny Mabie	Project Public Relations	EnviroIssues	(206) 269-5041	(206) 715-4342	pmabie@enviroissues.com
Kerston Swartz	Project Public Relations	EnviroIssues	(206) 269-5041	-	kswartz@enviroissues.com
Sally del Fierro	Public Affairs	Port of Seattle	(206) 728-3837	-	delfierro.s@portseattle.org
Barbara Smith	Public Affairs (for SCL)	Harris and Smith	(206) 343-0250	-	barbara@harrisandsmith.com
Jessica Mikasa	Public Affairs (for SCL)	Harris and Smith	(206) 343-0250	-	jessica@harrisandsmith.com

Name	Role	Organization	Business Phone	Mobile Phone	e-mail Address
Upland/Sediment Technical Team					
Grant Hainsworth	Technical Consultant Lead	Crete Consulting	(253) 797-6323	(253) 797-6323	grant.hainsworth@creteconsulting.com
Jamie Stevens	Regulatory Lead	Crete Consulting	(206) 799-2744	(206) 799-2744	jamie.stevens@creteconsulting.com
Mike Byers	Design Lead	Crete Consulting	(206) 491-7554	(206) 491-7554	mike.byers@creteconsulting.com
Geoff Saunders	Field Manager	Crete Consulting	(206) 383-9916	(206) 383-9916	geoff.saunders@creteconsulting.com
David Torseth	Public Bid Documents	Moffat & Nichol	(206) 622-0222	(206) 330-6920	dtorseth@moffatnichol.com
Greg Hartman	Sediment Design Review	Hartman Associates	(360) 329-5259	(206) 947-7465	hartmanassociates@gmail.com
Winston Chen	Civil/TCRA Support	AECOM	(206) 403-4293	(206) 446-8652	winston.chen@aecom.com
Jena Gilman	Sediment Design Support	AECOM	206) 403-9349	(425) 765-6274	jena.gilman@aecom.com
Frank Pita	Geotech Sr. Review	Jacobs Associates	(206) 588-8200	(425) 785-1109	pita@jacobssf.com
Lynn Salvati	Geotech Lead	Jacobs Associates	(206) 588-8200	-	salvati@jacobssf.com
Glenn Grette	Biology/Permitting Lead	Grette Associates	(509) 663-6300	(509) 669-6374	glenng@gretteassociates.com
Scott Maharry	Biology/Permitting Support	Grette Associates	(253) 573-9300	(253) 732-4096	scottm@gretteassociates.com
James Ruef	Groundwater/TCRA lead	Sealaska	(360) 930-3187	(206) 459-1372	james.ruef@sealaska.com
Glenn Hartmann	Archaeologist	Cultural Resource Consultants, Inc.	(206) 855.9020	-	glenn@crcwa.com
Streets and Yards Technical Team					
Reid Carscadden	S/Y Technical Consultant Lead	Integral Consulting	(206) 957-0350	(206) 713-4372	rcarscadden@integral-corp.com
Eric Pilcher	S/Y Design Lead	Integral Consulting	(206) 957-0337	(253) 370-5894	epilcher@integral-corp.com
Randi Wexler	S/Y Regulatory Lead	Integral Consulting	(503) 943-3628	(503) 201-8717	rwexler@integral-corp.com
Deborah Rudnick	S/Y Biology Permitting	Integral Consulting	(206) 957-0345	(206) 226-9648	drudnick@integral-corp.com
Jane Sund	S/Y Const. QA Lead	Integral Consulting	(503) 943-3615		jsund@integral-corp.com
Lisa Tolbert	S/Y Inv/Eng Support	Integral Consulting	(206) 957-0356	(206) 799-8179	ltolbert@integral-corp.com
Nick Varum	S/Y Investigation Lead	NW Enviro. Solutions	(503) 349-0841	(503) 349-0841	nvarum@gmail.com
John Zipper	S/Y Geotechnical Eng.	Terracon	(425) 771-3304	(425) 478-7748	jezipper@terracon.com
Jim Brennan	S/Y Landscape Arch.	J.A. Brennan	(206) 583-0620		jim@jabrennan.com

Appendix C

Draft Outlines for RvD/RvA Submittals

T-117 AIR MONITORING AND NOISE PLAN OUTLINE

Objective – The Air Monitoring and Noise Plan describes the protective measures that will be taken during the construction activities specially related to air monitoring/controls, noise monitoring/controls.

Table of Contents

1.0	Introduction
2.0	Project Background
3.0	Schedule and Scope of Sampling
3.1	Background Data Collection
3.2	Monitoring Locations
3.3	Monitoring Periods
4.0	Air Monitoring Protocol
4.1	Contaminants of Concern
4.2	Monitoring Methods
4.2	Action Levels and Contingencies
4.3	Data Management
4.4	Quality Control Requirements
4.5	Statistical Analysis of Data
5.0	Noise Monitoring Protocol
5.1	Noise
5.2	Monitoring Methods
5.3	Action Levels and Contingencies
5.4	Data Management
5.5	Quality Control Requirements
5.6	Statistical Analysis of Data
6.0	Reporting
6.1	Data Review and Reporting Schedule
6.2	Feedback and Response Mechanisms
7.0	Communication of Results
7.1	EPA
7.2	Port / City
7.3	Community
8.0	References

Key References

- Agency for Toxic Substances and Disease Registry. Minimal Risk Levels. December 2004
- Cleanup Level and Risk Calculations, Washington State Department of Ecology.

<https://fortress.wa.gov/ecy/clarc/CLARCHome.aspx>

- Compendium of Methods for the Determination of Toxic Organic Compounds in Ambient Air – Second Edition. EPA <http://www.epa.gov/ttn/amtic/airtox.html>
- NIOSH GUIDE TO CHEMICAL HAZARDS. December 2004. U.S. Department of Health and Human Services, Public Health Service, Centers for Disease Control, National Institute for Occupational Safety and Health
- NIOSH Manual of Analytical Methods, 4th Edition, Vol. 1 and Vol. 2, National Institute for Occupational Safety and Health (NIOSH) <http://www.cdc.gov/niosh/nmam/>
- NIOSH Pocket Guide to Chemical Hazards, Dept. of Health and Human Services, Publication No. 2005-149 <http://www.cdc.gov/niosh>
- OSHA Technical Manual, U.S. Dept. of Labor, Occupational Safety and Health Administration (OSHA) http://www.epa.gov/dts/osta/otm/otm_toc.htm
- Superfund Program Representative Sampling Guidance, Volume 2: Air (Short-Term Monitoring), Interim Final. 1995. EPA 540/R-95/140. (OSWER Directive 9360.4-09, PB 96-963206)

List of Figures

- Site Plan and Vicinity Map
- Other figures to be determined during report preparation

List of Tables

- Action Levels
- Other tables to be determined during report preparation

List of Appendices

- Records and Forms
- Other appendices to be determined during report preparation

Acronyms and Abbreviations

T-117 BIOLOGICAL ASSESSEMENT OUTLINE – UPLAND AND SEDIMENT AREA

A Biological Assessment (BA) is typically prepared to ensure compliance with the Endangered Species Act by identifying a project's environmental effects on listed species their habitat, and their food stocks. BA's also identify best management practices and conservation measures that are available to avoid or minimize potential adverse impacts.

To avoid redundancy and unnecessary expense, the T117 project will reference preexisting documents to characterize the project area and environmental effects of the project, including:

- *Final Biological Assessment - South Park Bridge Replacement* (March 2008)
- *Biological Opinion – South Park Bridge Replacement, U.S. Fish and Wildlife Service Reference #13410-2008-F-0383* (August 17, 2009)
- *Final Biological Assessment – Boeing Plant 2 Cleanup*
- *Final Biological Assessment - Jorgensen Forge Cleanup*

The above referenced documents will be used to inform a voluntary ESA Section 7 consultation process with the National Marine Fisheries Service and U.S. Fish & Wildlife Service. Project specific discussion and analysis will be provided as necessary in a supplemental Technical Memo that will generally include the following:

- background and project description;
- project schedule, including construction timing and sequence;
- exhibits illustrating project boundaries and phasing as appropriate;
- assessment of dredge residuals and water quality;
- assessment of underwater noise generated by potential pile driving activities;
- proposed conservation measures;
- effects determination; and,
- Essential Fish Habitat Determination.

T-117 DRAFT BIOLOGICAL ASSESSEMENT OUTLINE – STREETS AND RESIDENTIAL YARDS AREA

Objective - The Biological Assessment (BA) is prepared to ensure compliance with the Endangered Species Act by identifying the presence of threatened, endangered, proposed, or candidate species, or their habitat within the vicinity of the NTCRA. The intent of the BA is to characterize baseline conditions of the existing habitat and address potential impacts the removal action may have on these species, their habitat and food stocks. The BA also identifies best management practices and conservation measures designed to avoid or minimize potential impacts.

Table of Contents

1.0	Introduction
1.1	Project History
1.2	Federal Action History
1.3	Report Organization
2.0	Description of the Proposed Action
2.1	Project Purpose and objectives
2.2	Project description
2.2.1	Demolition
2.2.2	Excavation / Dredging
2.2.3	Fill
2.2.4	Stormwater Improvements
2.2.5	Paving
2.2.6	Landscaping
2.3	Proposed Conservation Measures
2.3.1	Construction BMPs, Operations Controls, and Equipment Options
2.3.2	Long-Term Monitoring and Maintenance
3.0	Biological Resources
3.1	Salmonids
3.1.1	Chinook Salmon, Puget Sound ESU
3.1.1.1	Population Status and Requirements

- 3.1.1.2 Critical Habitat
 - 3.1.2 Steelhead, Puget Sound Dps
 - 3.1.2.1 Population Status and Requirements
 - 3.1.2.2 Critical Habitat
 - 3.1.3 Bull Trout
 - 3.1.3.1 Population Status and Requirements
 - 3.1.3.2 Critical Habitat
- 3.2 Mammals
- 3.3 Birds
- 4.0 Essential Fish Habitat Evaluation
 - 4.1 Pacific Coast Salmon EFH
 - 4.1.1 Puget Sound Chinook ESU
 - 4.1.2 Puget Sound Steelhead DPS
 - 4.2 Groundfish EFH
- 5.0 Baseline Or Existing Environmental Conditions
 - 5.1 Shoreline and In-Water Habitats
 - 5.1.1 Shoreline Habitat
 - 5.1.2 Estuarine Habitat
 - 5.1.3 Benthic Habitat
 - 5.1.4 Prey Resources
 - 5.2 Water Quality
 - 5.2.1 Turbidity
 - 5.2.2 Dissolved Oxygen
 - 5.2.3 Temperature
 - 5.2.4 Current Patterns
 - 5.2.5 Contamination
 - 5.3 Sediment Quality
 - 5.3.1 Sediment Conditions
 - 5.3.2 Sediment Contamination
 - 5.4 Anthropogenic Activities

5.4.1	Disturbance/Noise
5.5	Summary of Baseline Conditions
5.6	Current Conditions of Primary Constituent Elements of Critical Habitat
6.0	Effects of the Proposed Action
6.1	Adverse Effects on Listed Species
6.1.1	Direct Effects
6.1.2	Indirect Effects
6.1.3	Interrelated, Interdependent, and Cumulative Effects
6.2	Adverse Effects on Critical Habitat
6.3	Effects Determination for Listed Species and Critical Habitat
6.4	Effects on Tribal Resources or Interests
7.0	Conclusion
8.0	References

Key References:

- Endangered Species Act (16 United States Code 1531).
 - Link: <http://www.fws.gov/le/pdf/files/esa.pdf>

List of Figures

- Vicinity Map
- Property Boundaries and Ownership
- Summary of Historical Dredging
- Habitat Types
- Summary of the Removal Design
- Summary of Preliminary Construction Schedule
- Other figures to be determined during report preparation

List of Tables

- Salmon Species in the Green/Duwamish River
- Juvenile Salmonids in the Lower Duwamish River
- Non-salmonid Fish Species in the Green/Duwamish River
- Bird Species Documented in the Lower Duwamish River
- Habitat Acres by Elevation Range
- Potential Effects of the Proposed Action on Threatened Species within the LDW
- Other tables to be determined during report preparation

Acronyms and Abbreviations

T-117 COMMUNITY HEALTH AND SAFETY PLAN OUTLINE

Objective – The Community Health and Safety Plan describes the protective measures that will be taken during the construction activities.

Table of Contents

- 1.0 Project Contacts and Emergency Information
- 2.0 Purpose
- 3.0 Site Layout and Control
- 4.0 Description of Site Tasks
- 5.0 Project Schedule
- 6.0 Potential Public Health and Safety Hazards
- 7.0 Control of Public Health and Safety Hazards
- 8.0 Emergency Response Plan
- 9.0 Communications Plan

List of Figures

- Site Plan and Vicinity Map
- Other figures to be determined during report preparation

List of Tables

- Air Quality Criteria/Values
- Other tables to be determined during report preparation

List of Appendices

- Standard Operating Procedures
- Records and Forms
- Other appendices to be determined during report preparation

Acronyms and Abbreviations

T-117 COMMUNITY RELATIONS PLAN OUTLINE – STREETS AND RESIDENTIAL YARDS AREA

Objective – The overall objectives of the community relations plan for the Streets and Yards Area are to:

- Inform and educate residents, businesses and the community about the cleanup
- Work directly and one-on-one with local residents impacted by street and yard cleanup activities.
- Encourage participation of impacted landowners in the specific remediation of their impacted property.
- Provide information to the community about project milestones
- Provide consistent follow up and clear messaging through the life of the project.
- Engage public health agencies to assist with risk communication directly to residents and interested community members.
- Provide meaningful opportunities to provide information to minority, low-income or limited-English speaking populations
- Ensure coordination and consistency with T-117 Upland and Sediments Area cleanup

Note: It is anticipated that community relation activities will be led by the Port team during planning, design, and implementation of the Upland/Sediments phase of the NTCRA, in close coordination with the City team to ensure consistency in messaging. Upon completion of the Upland/Sediment phase of the NTCRA, leadership of community relation activities will transition to the City team.

PUBLIC PARTICIPATION ACTIVITIES

Public outreach will involve the following elements:

1. Establish and/or maintain stakeholder relations
2. Community events and briefings
3. One-on-one meetings
4. Project information
5. Additional outreach to diverse communities

Table of Contents

1. STAKEHOLDER RELATIONS

- Maintain key stakeholder contact list
- Establish relationships with key community leaders who can help the project team engage diverse communities
- Maintain calendar of agency and community activities in near neighborhoods
- Media coordination

2. COMMUNITY EVENTS AND BRIEFINGS

- Attendance at community briefings (SPNA, Georgetown Community Council and other local organizations) when requested

3. ONE ON ONE MEETINGS

- Meet directly with impacted residents and property owners at their convenience and individualize information when appropriate to each property.

4. PROJECT INFORMATION

- Letters and visits to individual property owners/residents
- Facilitate health agencies in their communication about risk reduction
- Distribute flyers
- Prepare local signage with project details, contact information (use of recorded mobile updates, scan applications, etc)
- Update project kiosk
- Post to South Park list serv
- Update T117 website

5. ADDITIONAL OUTREACH TO DIVERSE COMMUNITIES

- Provide translations of printed materials (Spanish and Vietnamese)
- Provide interpreters at one on one and other project meetings

T-117 CONSTRUCTION HEALTH AND SAFETY PLAN OUTLINE

Objective – The Construction Health and Safety Plan describes the safety and health hazards that may exist for each phase of site operation and to identify procedures for the protection of employees and the surrounding environment.

Table of Contents

- 1.0 Project Manager and Other Key Contacts
- 2.0 Purpose/Definitions
- 3.0 Subcontractor Distribution/Acknowledgement
- 4.0 Chemical Hazard Evaluation
- 5.0 Physical Hazard Evaluation
- 6.0 Personal Protective Equipment and Safety Equipment
- 7.0 Air Monitoring
- 8.0 Health And Safety Training and Emergency Planning
 - 8.1 Health And Safety Training and Medical Monitoring
 - 8.2 Site Safety Meetings
 - 8.3 Emergency Planning and Telephone Numbers
- 9.0 Work Zones
- 10.0 Decontamination and Personal Hygiene
 - 10.1 Decontamination
 - 10.2 Personal Hygiene
- 11.0 Vehicle Safety, Spill Containment, and Shipping Instructions
 - 11.1 Vehicle Safety
 - 11.2 Spill Containment
 - 11.3 Shipping Information
- 12.0 Task Specific Safety Procedures
 - 12.1 Soil Sampling

Key References:

- Washington Industrial Safety And Health Act (Chapter 49.17 Revised Code Of Washington)
 - Link: <http://apps.leg.wa.gov/rcw/default.aspx?cite=49.17>
- Hazardous Waste Operations and Emergency Response (29 Code of Federal Regulations 1910.120), Occupational Safety and Health Administration.
 - Link: http://www.osha.gov/pls/oshaweb/owadisp.show_document?p_table=standards&p_id=9765

List of Figures

- Site Plan and Vicinity Map
- Site Control Map
- Hospital Route Maps
- Other figures to be determined during report preparation

List of Tables

- Air Quality Criteria/Values
- Project Contacts
- Other tables to be determined during report preparation

List of Appendices

- Standard Operating Procedures
- Records and Forms
- Other appendices to be determined during report preparation

Acronyms and Abbreviations

T-117 COMMUNITY COMMUNITY RELATIONS PLAN OUTLINE – SEDIMENT AND UPLAND AREA

Objective – The overall objectives of the community relations plan is to:

- Inform and educate community groups, residents, and businesses about cleanup design, the ongoing status of the T-117 site, and the Port’s decisions that led to the remedial construction.
- Consult with the community and provide opportunities for feedback during the design.
- Provide meaningful opportunities to minority, low-income or limited-English speaking populations to gain information.
- Remain consistent with earlier community involvement plans and commitments (e.g., Public Involvement Plan for the Engineering Evaluation/Cost Analysis).
- Ensure coordination and consistency with T-117 streets and yards cleanup, and other ongoing efforts that must meet EPA public involvement requirements.
- Coordinate with the Lower Duwamish Waterway Group and the Duwamish River Cleanup Coalition to maximize outreach opportunities and minimize public confusion.
- Provide consistent follow up and clear messaging through the life of the project.
- Engage public health agencies to assist with risk communication directly to residents and interested community members.

PUBLIC PARTICIPATION ACTIVITIES

The public involvement objectives described above are critical to the success of this project. In order to meet these objectives and maximize opportunities for community participation, the Port is planning to conduct various public outreach activities. This comprehensive list offers a suite of tools organized in following categories:

1. Establish and/or maintain stakeholder relations
2. Community events and briefings
3. Community meetings
4. Project information
5. Additional outreach to diverse communities

Table of Contents

1. STAKEHOLDER RELATIONS

- Maintain key stakeholder contact list
- Establish relationships with key community leaders who can help the Port engage diverse communities
- Maintain calendar of agency and community activities in near neighborhoods

- Media coordination

2. COMMUNITY EVENTS AND BRIEFINGS

- Attendance at fairs and festivals (i.e. Duwamish Alive, Duwamish River Festival)
- Attendance at community briefings (SPNA, Georgetown Community Council and other local organizations)

3. COMMUNITY MEETINGS

- Hold community meetings at key design milestones

4. PROJECT INFORMATION

- Manage frequently asked questions (FAQs)
- Facilitate health agencies in their communication about risk reduction
- Distribute flyers
- Display project posters
- Update project kiosk
- Post to South Park list serv
- Update T117 website

5. ADDITIONAL OUTREACH TO DIVERSE COMMUNITIES

T-117 CONSTRUCTION QUALITY ASSURANCE PLAN OUTLINE

Objective – The Construction Quality Assurance Plan describes how the Respondents, their consultants, and the selected Removal Action contractor will construct the removal project in a manner that complies with the conditions and requirements of the ASAO/SOW and subsequent design documents approved by the EPA for the removal action.

Table of Contents

- 1.0 Introduction
 - 1.1 Construction Activities Address by the Construction Quality Assurance Plan
 - 1.2 Document Organization
- 2.0 Project Organization and Responsibilities
 - 2.1 Removal Action Regulatory Personnel
 - 2.1.1 Remedial Project Manager
 - 2.1.2 Water Quality Specialist
 - 2.1.3 Construction Oversight Manager
 - 2.2 Removal Action Construction Implementation Personnel
 - 2.2.1 Project Manager
 - 2.2.2 Resident Engineer
 - 2.2.3 Construction Oversight / Quality Assurance Officer
 - 2.2.4 Site Safety Officer / Field Supervisor
 - 2.2.5 Analytical Quality Assurance Officer
 - 2.2.6 Analytical Laboratory Services
 - 2.2.7 Data Manager
 - 2.2.8 Designers
 - 2.2.9 Consultants
 - 2.3 Removal Action Contractor
 - 2.3.1 Contractor Project Manager
 - 2.3.2 Contract Site Supervisor
 - 2.3.3 Contractor Quality Control Representative

- 2.3.4 Contractor Site Engineer
 - 2.3.5 Contractor Site Health and Safety Supervisor
 - 2.3.6 Other Contractor Personnel
 - 2.3.7 Subcontractors
- 3.0 Inspection, Sampling, and Verification Activities
- 4.0 Documentation and Reporting
 - 4.1 Pre-Construction Documentation
 - 4.1.1 Draft RAWP
 - 4.1.2 Final RAWP
 - 4.2 Construction Documentation
 - 4.2.1 Daily Construction Quality Control Report
 - 4.2.2 Weekly Quality Assurance Report
 - 4.2.3 Water Quality Monitoring Reports
 - 4.2.4 Survey Reporting
 - 4.2.5 Waste Characterization Testing Reports and Waste Manifests
 - 4.2.6 Import Material Characterization Reports
 - 4.2.7 Field Change Documentation
 - 4.3 Post-Construction Documentation
 - 4.3.1 Record Drawings, Manuals and Certifications
 - 4.3.2 Pre-Final Punch List
- 5.0 Removal Action Construction Elements
 - 5.1 Survey Controls and Project Limits
 - 5.1.1 Description
 - 5.1.2 Potential Concerns and Quality Control Measures
 - 5.1.3 Environmental Controls, Monitoring, and Corrective Action
 - 5.2 Placement of BMPs and Modification of Existing Utilities
 - 5.2.1 Description
 - 5.2.2 Potential Concerns and Quality Control Measures
 - 5.2.3 Environmental Controls, Monitoring, and Corrective Action
 - 5.3 Demolition And Removal

5.3.1	Description
5.3.2	Potential Concerns and Quality Control Measures
5.3.3	Environmental Controls, Monitoring, and Corrective Action
5.4	Dredging and Excavation
5.4.1	Description
5.4.2	Potential Concerns and Quality Control Measures
5.4.3	Environmental Controls, Monitoring, and Corrective Action
5.5	Transloading, Transportation and Disposal
5.5.1	Description
5.5.2	Potential Concerns and Quality Control Measures
5.5.3	Environmental Controls, Monitoring, and Corrective Action
5.6	Placement of Fill
5.6.1	Description
5.6.2	Potential Concerns and Quality Control Measures
5.6.3	Environmental Controls, Monitoring, and Corrective Action
5.7	Installation of Improvements
5.7.1	Description
5.7.2	Potential Concerns and Quality Control Measures
5.7.3	Environmental Controls, Monitoring, and Corrective Action
6.0	References

Key References:

- Template - "Lower Duwamish Waterway, Slip 4 Early Action Area, 100% Design Submittal, Construction Quality Assurance Plan". Integral Consulting Inc., Seattle, WA. August 30, 2010.

List of Figures

- Project Organization Chart
- Other figures to be determined during report preparation

List of Tables

- Summary of Construction Monitoring and Quality Assurance Testing Requirements

- Submittals Required Before, During and After Completion of Tasks
- Other tables to be determined during report preparation

List of Appendices

- Appendix A. Removal Action Field Sampling Plan (FSP)
- Appendix B. Removal Action Quality Assurance Project Plan (QAPP)
- Other appendices to be determined during report preparation

Acronyms and Abbreviations

T-117 DRAFT FIELD SAMPLING PLAN OUTLINE

Objective – The Field Sampling Plan describes the organizational structure for sampling activities, anticipated field event schedule, field sampling methods (and other procedures that will be followed during field operations), and the laboratory analyses to be conducted.

Table of Contents

1.0	Field Sampling Plan
1.1	Introduction and Overview
1.2	Project Organization
1.2.1	Team Organization and Responsibilities
1.2.2	Personnel
1.3	Field Sampling Schedule
1.4	Field Survey and Sampling Methods
1.4.1	Station Positioning
1.4.2	Field Equipment and Supplies
1.4.3	Surface Sediment and Soil Sampling
1.4.4	Equipment Decontamination
1.4.5	Investigation-Derived Waste
1.5	Field Documentation
1.5.1	Field Logbook
1.5.2	Chain-of-Custody Procedures
1.6	Sample Handling and Transport
1.7	Field Quality Control Samples
1.7.1	Field QC Samples
1.8	Laboratory Analyses
2.0	Standard Operating Procedure
2.1	Surface Sediment and Soil Sampling
2.1.1	Scope and Application
2.1.2	Summary of Method
2.1.3	Equipment and Supplies

2.2 Sampling Procedures

- 2.2.1 Equipment Decontamination
- 2.2.2 Sample Collection
- 2.2.3 Sample Processing
- 2.2.4 Chain-of-Custody
- 2.2.5 Field
- 2.2.6 Laboratory
- 2.2.7 Chain-of-Custody Quality Control Procedures
- 2.2.8 Packing and Shipping Samples
- 2.2.9 Sample Packing
- 2.2.10 Sample Shipping

3.0 References

Key References:

- “Guidance on Choosing a Sampling Design for Environmental Data Collection” (QA/G-5S). December 2002. EPA/240/R-02/005
 - Link: <http://www.epa.gov/quality/qs-docs/g5s-final.pdf>
- “Guidance for Preparing Standard Operating Procedures” (QA/G-6). April 2007 EPA/600/B-07/001
 - Link: <http://www.epa.gov/quality/qs-docs/g6-final.pdf>

T-117 LONG-TERM MONITORING AND MAINTENANCE PLAN

Objective – The Long-Term Monitoring and Maintenance Plan has the following objectives:

- Long-term confirmation of maintaining performance standards;
- Evaluating the long-term effectiveness of source control; and
- Evaluating habitat function and fisheries resource as needed to verify compliance with permitting requirements.

Table of Contents

1.0 Monitoring Plan Approach and Objectives
2.0 Field Sampling Plan
2.1 Team Organization and Personnel
2.2 Monitoring and Sampling Methods and Equipment
2.3 Chain-of-Custody Procedures
2.4 Sample Handling & Transport
2.5 Sample Documentation
2.6 Investigation-Derived Waste
2.7 Training Requirements and Certifications
2.8 Laboratory Analysis
3.0 Project Documentation
4.0 Quality Control and Quality Assurance Procedures
5.0 Data Management
6.0 Sampling Schedule
7.0 Reporting
8.0 Data Review and Reporting Schedules
9.0 References

Key References:

- “Guidance on Choosing a Sampling Design for Environmental Data Collection” (QA/G-5S). December 2002. EPA/240/R-02/005
 - Link: <http://www.epa.gov/quality/qs-docs/g5s-final.pdf>
- “Guidance for Preparing Standard Operating Procedures” (QA/G-6). April 2007 EPA/600/B-07/001
 - Link: <http://www.epa.gov/quality/qs-docs/g6-final.pdf>

List of Figures

- Monitoring locations
- Other figures to be determined during report preparation

List of Tables

- Table 1. Sample field data log
- Table 2. Sample monitoring summary table.
- Table 3. Sample master activity log.
- Other tables to be determined during report preparation

List of Attachments

- Standard Operating Procedures
- Field Investigation Forms
- Other attachments to be determined during report preparation

Acronyms and Abbreviations

T-117 PERMITTING AND SITE ACCESS PLAN

Objective – The overall objectives of the Permitting and Site Access Plan is to demonstrate how the final design complies with the permitting requirements and address property and easement requirements. The plan will also provide a strategy and appropriate information for obtaining agreements for access to the site or associated areas as necessary for the implementation of the removal action.

Table of Contents

- 1.0 Introduction
- 2.0 Description of Permitting Requirements
- 3.0 Compliance with Permitting Requirements
- 4.0 Description of Access Easements/Agreements Required
- 5.0 Plan/Methods for Obtaining Agreements

T-117 QUALITY ASSURANCE PROJECT PLAN OUTLINE

Objective - The quality assurance project plan (QAPP) describes quality assurance/quality control (QA/QC) procedures that will be used to verify the completeness of the removal action.

Table of Contents

- A. Project Management
 - A.1 Title and Approval Sheet
 - A.2 Table of Contents
 - A.2.1 List of Figures
 - A.2.2 List of Tables
 - A.2.3 Acronyms and Abbreviations
 - A.3 Distribution List
 - A.4 Background and Problem Definition
 - A.4.1 Background
 - A.4.2 Problem Definition
 - A.5 Project Task Description
 - A.6 Organization and Schedule
 - A.6.1 Task Organization
 - A.6.2 Regulatory Agency Management
 - A.6.3 City and Port Management
 - A.6.4 Project Personnel
 - A.6.5 Project Subcontractors
 - A.6.6 Schedule
 - A.7 Quality Objectives and Criteria For Measurement Data
 - A.7.1 Data Quality Objectives
 - A.7.2 Data Quality Indicators
 - A.7.2.1 Precision
 - A.7.2.2 Accuracy
 - A.7.2.3 Representativeness
 - A.7.2.4 Completeness

A.7.2.5 Comparability

A.8 Special Training/Certification

A.9 Documents and Records

A.9.1 Field Documentation

A.9.2 Laboratory Documentation

A.9.3 Data Quality Documentation

B. Data Generation and Acquisition

B.1 Sampling Process Design

B.1.1 Area and Boundary Characterization

B.1.2 Investigation

B.1.3 Evaluation

B.2 Sampling Methods

B.2.1 Utility Survey

B.2.2 Sample Locations

B.2.3 Sampling Equipment Decontamination

B.2.4 Sample Collection

B.2.4.1 Soil

B.2.4.2 Water

B.2.5 Sample Identification and Labeling

B.2.5.1 Sample IDs

B.2.5.2 Sample Numbers

B.2.5.3 Sample Labeling

B.3 Sample Handling and Custody

B.4 Analytical Methods

B.4.1 Laboratory Analyses

B.5 Quality Control

B.5.1 Field Quality Control Samples

B.5.2 Laboratory Quality Control

B.6 Instrument/Equipment Testing, Inspection and Maintenance

B.7 Instrument/Equipment Calibration and Frequency

- B.8 Inspection/Acceptance of Supplies and Consumables
 - B.9 Non-Direct Measurements
 - B.10 Data Management
 - B.10.1 Field Data
 - B.10.2 Laboratory Data
 - C. Assessment and Oversight
 - C.1 Assessment and Response Actions
 - C.2 Reports to Management
 - D. Data Validation and Usability
 - D.1 Criteria for Data Review, Verification, and Validation
 - D.2 Verification and Validation Methods
 - D.3 Reconciliation with User Requirements
 - E. References
-

Key References:

- “Guidance for Quality Assurance Project Plans” (EPA QA/G-5). December 2002.
EPA/240/R-02/009
 - Link: <http://www.epa.gov/quality/qs-docs/g5-final.pdf>
- “EPA Requirements for Quality Assurance Project Plans” (EPA QA/R-5). March 2002.
EPA/240/B-01/003
 - Link: <http://www.epa.gov/quality/qs-docs/r5-final.pdf>

List of Figures

- Project Organization Chart
- Other figures to be determined during report preparation

List of Tables

- Data validation goals
- Laboratory Reporting limits
- Other tables to be determined during report preparation

Acronyms and Abbreviations

T-117 REMOVAL ACTION DESIGN REPORT OUTLINE

Objective – The Removal Action Design Report will detail the final removal action for the site. A 60% draft and a 90% draft will be submitted to EPA for review and approval. A 100% final report will address comments on the 90% document. Below is an outline for the removal action design. Draft appendices (which include key plans/deliverables) will be submitted in the 90%/100% submittals; final documents will be submitted in the Removal Action Work Plan.

Table of Contents

- 1.0 Introduction
 - 1.1 Site physical location
 - 1.2 Description of site Removal Action Areas
- 2.0 Performance Requirements
 - 2.1 Remediation Criteria
 - 2.2 Regulatory Requirements
 - 2.3 Commitments to Third Parties and Stakeholders
 - 2.4 License and Training Requirements
- 3.0 Existing Conditions
 - 3.1 Site Topography and Stratigraphy
 - 3.2 Site Utilities and Structures
 - 3.3 Site Restrictions
 - 3.4 Soil Properties
 - 3.5 Sediment Properties (Sediment Area Only)
 - 3.6 Hydrogeologic Conditions
 - 3.7 Site Hydrology
 - 3.8 Habitat/Species Use
- 4.0 Removal Design
 - 4.1 Property Ownership and Access Needs/Requirements
 - 4.2 Structure Demolition
 - 4.3 Soil Staging/Stockpiling and Haul Route Design
 - 4.4 Sediment Staging (Sediment Area Only)
 - 4.5 Transload Facility Evaluation
 - 4.6 Geotechnical Design
 - 4.7 Barrier between upland and Sediment Removal (Sediment Area Only)
 - 4.8 Dredging Design (Sediment Area Only)
 - 4.9 Dredge Residuals Monitoring and Control (Sediment Area Only)

- 4.10 Confirmation Sampling
- 4.11 Waste Management
- 4.12 Water Management
- 4.13 Site Controls
- 4.14 Temporary Erosion & Sediment Control
- 4.15 Utility Protection (possibly Streets and Yards Areas Only)
- 4.16 Site Restoration Requirements
- 4.17 Retaining Wall Design (Streets Area Only)
- 4.18 Sustainable Design Components
- 5.0 Contract Sequence Plan
 - 5.1 Organization of Bid Package(s)
 - 5.2 Unique Construction Attributes or Specialty Work
 - 5.3 Remedial Action Sequence
 - 5.4 Construction Schedule Milestones
 - 5.5 Contractors Required

6.0 References

Key References

- *Remedial Design/Remedial Action (RD/RA) Handbook*, U.S. EPA, Office of Solid Waste and Emergency Response (OSWER) 9355.0-O4B, EPA 540/R-95/059, June 1995.
- *Guidance on EPA Oversight of Remedial Designs and Remedial Actions Performed by Potential Responsible Parties*, U.S. EPA Office of Emergency and Remedial Response, EPA/540/G-90/001, April 1990.
- *Guidance on Expediting Remedial Design and Remedial Actions*, EPA/540/G-90/006, August 1990.

List of Figures

- Site Plan and Vicinity Map
- Summary of Existing Conditions
- Haul Routes
- Other figures to be determined during report preparation

List of Tables

- Summary of Performance Criteria
- Summary of Design Acceptance Criteria
- Summary of Assumptions and Uncertainties
- Materials of Construction Analysis

- Other tables to be determined during report preparation

List of Appendices

- Draft Construction Quality Assurance Plan
- Draft Water Quality Monitoring Plan
- Draft Construction Health and Safety Plan
- Draft Community Health and Safety Plan
- Draft Operation, Maintenance and Monitoring Plan
- Draft Long-term Monitoring and Maintenance Plan
- Site Management Plan
- Construction Plans and Specifications

Acronyms and Abbreviations

T-117 REMOVAL ACTION WORK PLAN OUTLINE

Objective – The Removal Action Work Plan includes a detailed description of the NTCRA and construction activities, including how those construction activities are to be implemented and coordinated with EPA. The Removal Action Work Plan will include a project schedule for each major activity and submission of deliverables generated during the NTCRA.

Table of Contents

1.0	Introduction
1.1	Project Background and Federal Action History
1.2	Action Areas
1.2.1	Upland/Sediments/Streets/Yards (as applicable)
1.3	Report Organization
2.0	Permits
3.0	Removal Action Team Organization
3.1	Agency Personnel
3.2	Construction Management and Oversight Personnel
3.3	Construction Contractors
3.3.1	Contractor Selection
3.3.2	Contractor Personnel
3.3.3	Contractor Qualifications
4.0	Plan for the Removal Action
4.1	Site Access
4.2	Utility Clearance
4.3	Historic Preservation
4.4	Removal Action
4.4.1	Field Screening
4.4.2	Cultural Artifacts/Archeological Monitoring
4.4.3	Air Monitoring - Community
4.5	Confirmation Sampling
4.6	Site Restoration

- 4.7 Site Survey
- 4.8 Performance Standards
 - 4.8.1 Dredging Methods and Procedures (Sediment Area Only)
 - 4.8.2 Excavation Methods and Procedures
 - 4.8.3 Equipment
- 5.0 Quality Assurance/Quality Control
 - 5.1 Submittal Management
 - 5.2 Progress Meetings
 - 5.3 Inspections, Sampling and Verification Activities
 - 5.3.1 Air Monitoring
 - 5.3.2 Water Quality Monitoring
 - 5.3.3 Confirmation Sampling
 - 5.4 CQA Documentation and Reporting
 - 5.5 Field Change Documentation
 - 5.6 Post-Construction Documentation
- 6.0 References

Contractor Submitted Removal Action Work Plan Components Appendix

- 1.0 Project Work Plan
 - 1.1 Contractor Means and Methods
 - 1.2 Temporary Facilities and Staging
 - 1.3 Offsite Staging
- 2.0 Demolition Plan
- 3.0 Transportation and Disposal Plan
 - 3.1 Decontamination Procedures
- 4.0 Dredging and Excavation Plan (Dredging for Sediment Area Only)
 - 4.1 Shoring and Dewatering
- 5.0 Survey Plan
- 6.0 Vessel Management Plan (Sediment Areas Only)
- 7.0 Traffic Control Plan

8.0	Capping Plan
9.0	Contractor Quality Control Plan
9.1	CQC Plan Overview
9.2	Sampling and Analysis Plan
10.0	Environmental Pollution Control Plan
10.1	EPC Plan Overview
10.2	Temporary Erosion and Sediment Control Plan
10.2.1	Dust Suppression
10.2.2	Water Quality Measures
10.3	Spill Prevention Control and Countermeasures Plan
11.0	Site Specific Health and Safety Plan
12.0	Schedule
13.0	Quality Control

Key References

- *Remedial Design/Remedial Action (RD/RA) Handbook*, U.S. EPA, Office of Solid Waste and Emergency Response (OSWER) 9355.0-O4B, EPA 540/R-95/059, June 1995.
- *Guidance on EPA Oversight of Remedial Designs and Remedial Actions Performed by Potential Responsible Parties*, U.S. EPA Office of Emergency and Remedial Response, EPA/540/G-90/001, April 1990.
- *Guidance on Expediting Remedial Design and Remedial Actions*, EPA/540/G-90/006, August 1990.

List of Figures

- Site Plan and Vicinity Map
- Summary of Soil Removal Actions
- Dredge Plan (Sediment Area Only)
- Contractor's Proposed Construction Schedules
- Truck Haul Route
- Barge Haul Route (Sediment Area Only)
- Site Completion and Stabilization
- Organization Chart
- Other figures to be determined during report preparation

List of Tables

- Quality Guidelines

- Import Material Guidelines
- Other tables to be determined during report preparation

List of Appendices

- Contractor Submitted Removal Action Work Plan Components
- Final Construction Quality Assurance Plan
- Final Water Quality Monitoring Plan (Sediment Area Only)
- Final Operation, Maintenance and Monitoring Plan
- Final Construction Health and Safety Plan
- Final Community Health and Safety Plan

Acronyms and Abbreviations

T-117 REMOVAL ACTION CONSTRUCTION REPORT OUTLINE

Objective – The Removal Action Construction Report documents the NTCRA construction activities.

Table of Contents

1.0	Introduction
2.0	Removal Action Areas
3.0	Removal Action Objectives
4.0	Report Organization
5.0	Summary of Removal Actions
5.1	Sediments (Sediment Area Only)
5.1.1	Site Preparation
5.1.2	Demolition
5.1.3	Removal
5.1.4	Restoration
5.2	Uplands (Upland Area Only)
5.2.1	Site Preparation
5.2.2	Demolition
5.2.3	Removal
5.2.4	Restoration
5.3	Streets (Streets and Yards Area Only)
5.3.1	Site Preparation
5.3.2	Demolition
5.3.3	Removal
5.3.4	Restoration
5.4	Yards (Streets and Yards Area Only)
5.4.1	Site Preparation
5.4.2	Demolition

5.4.3	Removal
5.4.4	Restoration
6.0	Construction Deviations
7.0	Summary of Monitoring and Construction Quality Assurance
7.1	Backfill Material Documentation
7.1.1	Soil Removal Action (Upland and Streets and Yards Areas)
7.1.2	Sediment Removal Action (Sediment Area Only)
7.2	Transportation and Disposal Documentation
7.2.1	Soil Removal Action (Upland and Streets and Yards Areas)
7.2.2	Sediment Removal Action (Sediment Area Only)
7.3	Water Quality Documentation
7.4	Cultural Resource Monitoring
7.5	Health and Safety Monitoring Results
8.0	Performance Standards Attainment
8.1	Soil Removal Performance Standards
8.2	Sediment Dredge Removal Performance Standards (Sediment Area Only)
9.0	References

Key References

- *Remedial Design/Remedial Action (RD/RA) Handbook*, U.S. EPA, Office of Solid Waste and Emergency Response (OSWER) 9355.0-O4B, EPA 540/R-95/059, June 1995.
- *Guidance on EPA Oversight of Remedial Designs and Remedial Actions Performed by Potential Responsible Parties*, U.S. EPA Office of Emergency and Remedial Response, EPA/540/G-90/001, April 1990.
- *Guidance on Expediting Remedial Design and Remedial Actions*, EPA/540/G-90/006, August 1990.

List of Figures

- Site Plan and Vicinity Map
- Summary of Sampling Locations
- As-Built Post Dredge and Soil Removal and Cross Section Locations
- Post Dredge and Soil Removal Cross Sections
- Water Quality Monitoring Locations
- Confirmation Sampling Locations

- Other figures to be determined during report preparation

List of Tables

- Soil Removal Log Summary Table
- Dredging Log Summary Table (Sediment Area Only)
- Summary of Material Disposal
- Import Material Quantities
- Water Quality Monitoring Results
- Confirmation Sample Results
- Other tables to be determined during report preparation

List of Appendices

- Construction Weekly Progress Reports
- Import Material Characterization Results
- Transloading Facility Data Sheets
- Water Quality Monitoring Results (Sediments Area Only)
- Construction Equipment Decontamination Observation Reports
- Health and Safety Monitoring Documentation
- Chemical Analytical Data Validation Reports
- Construction Photos
- Documentation of Disposal Material Volumes, Weather Checks, and Special Waste Permit
- Documentation of Import and Disposal Material Volumes
- Construction Stormwater BMP Inspection Reports
- Construction Stormwater Discharge Monitoring Reports

Acronyms and Abbreviations

T-117 WATER QUALITY MONITORING PLAN OUTLINE

Objective – The Water Quality Monitoring describes the organizational structure for sampling activities, anticipated field event schedule, field sampling methods (and other procedures that will be followed during field operations), and the laboratory analyses to be conducted associated with the water quality monitoring plan.

Table of Contents

- 1 Introduction
- 2 Water Column Monitoring (Sediment Only)
 - 2.1 Applicable Water Quality Standards
 - 2.1.1 Turbidity (NTUs)
 - 2.1.2 Dissolved Oxygen
 - 2.1.3 Chemicals of Concern (COCs)
 - 2.2 Monitoring Schedule
 - 2.3 Monitoring Locations
 - 2.4 Monitoring Depths
- 3 Field Sampling Plan
 - 3.1 Team Organization and Personnel
 - 3.2 Field Sampling Schedule
 - 3.3 Monitoring and Sampling Methods and Equipment
 - 3.3.1 Sample Location Determination and Documentation
 - 3.3.2 Equipment Calibration and Handling
 - 3.3.3 Equipment Decontamination
 - 3.3.4 Water Sample Collection
 - 3.4 Chain-of-Custody Procedures
 - 3.5 Sample Handling & Transport
 - 3.6 Sample Documentation
 - 3.7 Investigation-Derived Waste
 - 3.8 Training Requirements and Certifications
 - 3.9 Quality Control and Quality Assurance Procedures
 - 3.10 laboratory analysis
- 4 Reporting
 - 4.1 Sample numbering
 - 4.2 Data Management
 - 4.3 Data Review and Reporting Schedules
 - 4.4 Responses to Exceedances of Water Quality Criteria

5 References

Key References:

- “Guidance on Choosing a Sampling Design for Environmental Data Collection” (QA/G-5S). December 2002. EPA/240/R-02/005
 - Link: <http://www.epa.gov/quality/qs-docs/g5s-final.pdf>
- “Guidance for Preparing Standard Operating Procedures” (QA/G-6). April 2007 EPA/600/B-07/001
 - Link: <http://www.epa.gov/quality/qs-docs/g6-final.pdf>

List of Figures

- Sample Location
- Other figures to be determined during report preparation

List of Tables

- Table 1. Sample field data log
- Table 2. Sample monitoring summary table.
- Table 3. Sample master activity log.
- Other tables to be determined during report preparation

Acronyms and Abbreviations


Appendix D

Sample Design Review Form

DESIGN REVIEW COMMENT RESOLUTION FORM

Submittal Title:	Design Phase (%):
Project Title: T117 CLEANUP DESIGN	Project ID / Activity:
Project Manager/Phone:	Dept – Reviewer(s)
Project A/E:	Due Date:
Drawing Set Title as Shown on the Drawing Cover Sheet:	

1	2	3	4	5	6	7	8	9
Item No.	Reviewer Initials	Drawing or Specification Reference	Reviewer Comment	PM Filter/Comment	A/E Response and Directives	Reviewer Concur Y/N	PM Directs A/E to Proceed OK	A/E QC Complete INIT
1.								
2.								
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